EVALUATION ASSESSMENT REPORT
NATURAL RESOURCE CONSERVATION COMPONENT
ENVIRONMENT CANADA

April 3, 1990

Young & Wiltshire

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I INTRODUCTION

1.1 Study Background

The purpose of this study is to provide Environment Canada with an Evaluation Assessment of the Natural Resource Conservation sub-activity of Conservation and Protection (C&P). The evaluation assessment was conducted in accordance with Office of the Comptroller General principles and standards, and with appropriate reference to government policy on the evaluation of Major Survey Programs and Regulatory Programs.

1.2 Purpose of Program Evaluation Assessments

Federal government policy on program evaluation requires that a program evaluation assessment be conducted in the period immediately preceding a program evaluation study.

The purpose of a program evaluation assessment is to provide for a planning phase before an evaluation study is begun. The evaluation assessment contains a descriptive profile of the program to ensure that the rationale, objectives, design, and delivery of the program are understood. The evaluation assessment ensures:

- a good selection of issues;
- a cost effective methodology;
- sufficient information for decision making; and
- it adds to the level of conclusiveness of study results.

The evaluation issues identified reflect current management needs and priorities. Evaluation study options are prepared which consist of choices with respect to issue coverage, methodologies, resources and timing.

1.3 Report Structure

This report presents the findings from our evaluation assessment of the Natural Resource Conservation sub-activity of the Conservation and Protection activity. The report is structured in the following manner:

Section II presents the Natural Resource Conservation Component Profile which describes the mandate, objectives, activities and outputs, resources, structure, and linkages of the Natural Resource Conservation sub-activity.

Section III presents a list of issues that have been selected to be included in the options for the subsequent evaluation. It also describes the most appropriate indicators for responding to the evaluation issues.

Section IV presents our evaluation design which describes appropriate evaluation methodologies for use in obtaining the performance indicator information required to address the evaluation issues.

Section V presents evaluation options or strategies for completing the evaluation of the Natural Resource Conservation sub-activity.

II COMPONENT PROFILE

2.1 Background

The purpose of the Component Profile is to provide an understanding of the entity to be evaluated. This can be accomplished through a description of the mandate, objectives, organizational structure and resources, activities and outputs, and key threats and opportunities of the organization to be reviewed. In order to provide an appropriate understanding of the Natural Resource Conservation sub-activity of Conservation and Protection (C&P), we will begin with a brief description of the Conservation and Protection activity, followed by a more detailed description of the Natural Resource Conservation sub-activity.

2.2 Conservation and Protection

Description

Conservation and Protection is one of two activities of the Environmental Services Program of Environment Canada. It fulfils federal responsibilities relating to the sound management and development of Canada's water and land resources, migratory birds and threatened and endangered species, and other national and international wildlife issues. C&P plays a key role in developing and maintaining the knowledge base necessary for assessing the significance of environmental threats arising from human activities, and for devising consultation, advocacy, and regulatory activities.

The Conservation and Protection activity of the Environment Canada Operational Planning Framework (OPF) was created from the 1986 consolidation of the Environmental Conservation Service and Environmental Protection Service into C&P. Initially, the C&P OPF depicted the activity in terms of four sub-activities:

- Inland Waters Conservation;
- Wildlife Conservation;
- Environmental Protection; and
- Management and Common Support.

In November 1987, the Assistant Deputy Minister (ADM), Conservation and Protection initiated the development of a "results definition model" for C&P. The Results Model/Operational Planning Framework Project Report indicated that a key limitation of the original C&P OPF was that it " highlighted the major organizational components of C&P rather than C&P itself". This focus had three undesirable consequences. First, undue emphasis is placed on the activities of the organizations, rather than the results they are intended to achieve. Second, the development of a common vision of C&P as an entity is inhibited. And third, by emphasizing vertical organizations it becomes more difficult to shift C&P resources horizontally in order to respond to changing program priorities.

The C&P Results Model (see Appendix A) was submitted to Management Board in June 1988 and approved for implementation in the 1989/90 planning cycle. The new Results Model, with its emphasis on C&P's mission, client needs and expected results had the following advantages:

- it would be useful for enhancing C&P communications both internally and externally; and
- it would help improve the C&P program planning and review process by integrating the planning structures of the various C&P component organizations, and at the same time respond to Treasury Board's requirement for a results oriented Operational Planning Framework.

The C&P Results Model defines the general purpose and orientation of C&P in the following "mission" statement:

- Contribute to the Conservation and Protection of the Canadian and Global Environments for Sustained Benefits"

A key element of the mission statement is its recognition that C&P contributes to the conservation and protection of the Canadian and world environments. The mission highlights the fact that C&P must work in collaboration with many other groups, such as other levels of government, industry, environmental NGOs and the general public, in carrying out its mission.

Flowing out of this mission are three Needs statements which reflect public needs or expectations of the C&P activity. These are:

* A - Conserve Canada's Natural Resources
* B - Manage Ecological and Economic Interdependence
* C - Protect Canada's Environment from Degradation

The focus of this evaluation assessment will be on Need A "Conserve Canada's Natural Resources".

The Results Model goes on to define Effects in terms of these public needs and expectations. There are two types of effects described in the model. The first describes the environmental improvements that are expected to be achieved by C&P programs. Examples are "Wildlife Habitat is Maintained or Enhanced" and "Canada's Access (Quality/Quantity) to International Water and Wildlife Resources is Maintained or Improved". The second type are "strategic" in that they highlight how C&P contributes to the achievement of the desired environmental effects. The Results Model identifies four generic strategies to be employed in achieving the environmental effects. These are:

o Science/Data - which includes all strategies devoted to the development of environmental knowledge, such as research and data collection;

o Communications - which incorporates the results expected from communicating environmental knowledge to potential users of that knowledge;

o Influence/Leadership - which emphasizes that C&P's role is often limited to trying to get others to act "responsibly" with respect to environmental problems; and

o Enforcement/Compliance - which include all results expected from the application of regulations inherent in environmental conservation/protection legislation.

The final link in the Results Model is the relationship between specific activities and effects. Given the effects orientation of the model, C&P activities must support an environmental improvement in order to be justified.

Program Delivery

The Conservation and Protection activity has the following three sub-activities:

* Natural Resource Conservation;

* Environment - Economy Management; and

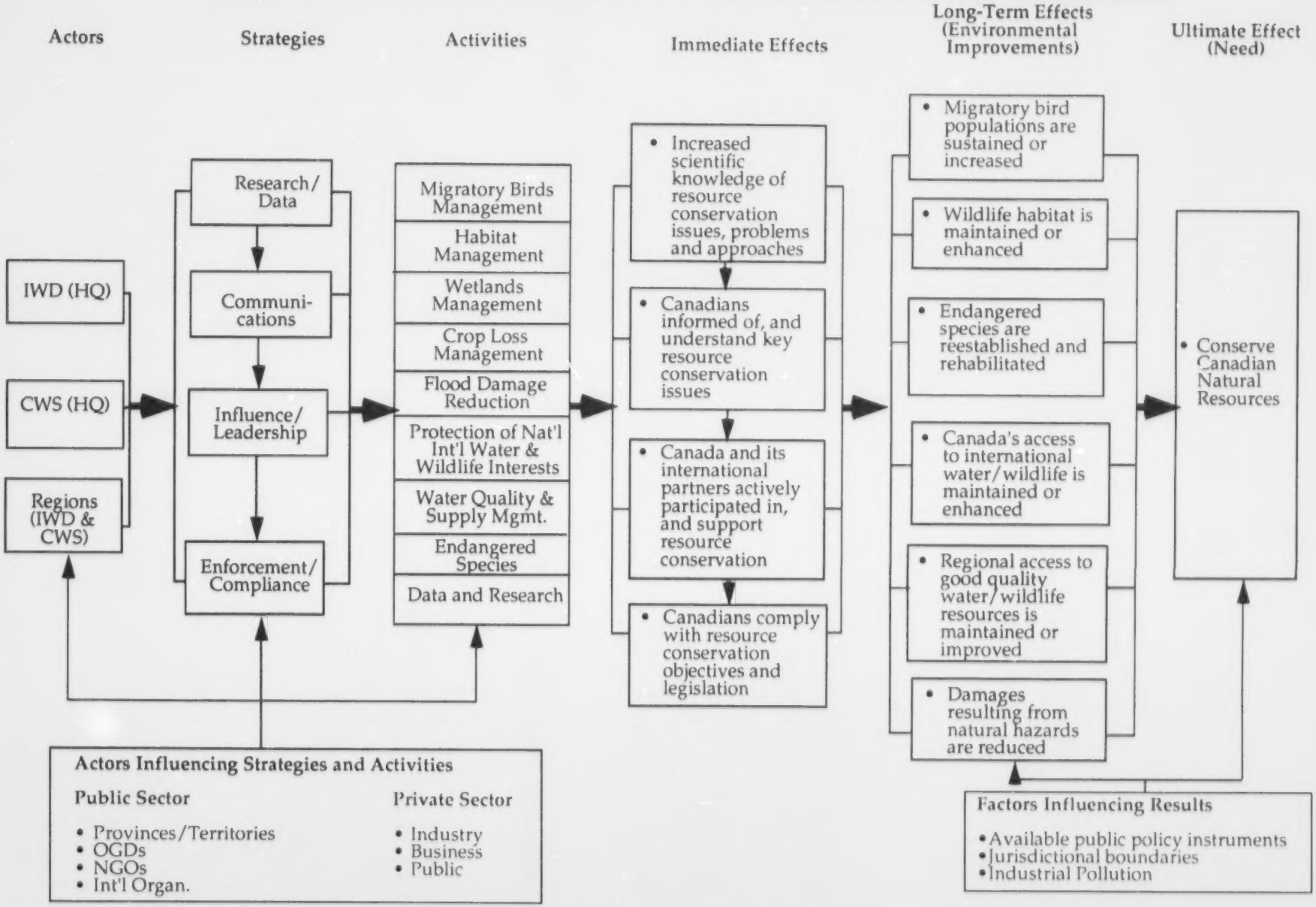
* Environmental Quality Protection.

Conservation and Protection is currently organized into three program directorates, Inland Waters, Canadian Wildlife Service and Environmental Protection. In addition, there are Policy, Management Information and Accountability, Finance and Administration, and Personnel Branches. Although all groups contribute to the achievement of C&P goals, individual directorates have leading roles in the delivery of programs associated with each sub-activity.

The Natural Resource Conservation sub-activity programs are delivered primarily through the Inland Waters Directorate (IWD) and the Canadian Wildlife Service (CWS). The Environmental Quality Protection and Environment - Economy Management sub-activity programs are delivered jointly through the Environmental Protection Directorate (EP), IWD and CWS.

Conservation and Protection utilizes a matrix management type structure which results in the following reporting relationships. The Directors-General of each of the IWD, CWS, and EPD are located in the National Capital Region and are responsible for the delivery of national programs. The staff of each of the directorates located in the regions do not report directly to the Directors-General at Headquarters, but rather through Regional Directors-General, Conservation and Protection. IWD, CWS and EPD staff located at Headquarters provide functional guidance to regional staff in their respective Directorates, but do not exercise line authority. Headquarters is located in the National Capital Region. The five regional offices are located as follows: Halifax, N.S. (Atlantic Region); Quebec City, Quebec (Quebec region); Toronto, Ontario (Ontario region); Edmonton, Alberta (Western and Northern Region); and Vancouver, B.C. (Pacific and Yukon Region).

EXHIBIT 1 - NATURAL RESOURCE CONSERVATION LOGIC MODEL


Actors
Strategies
Activities
Immediate Effects
Long-Term Effects (Environmental Improvements)
Ultimate Effect (Need)
IWD (HQ)
CWS (HQ)
Regions (IWD & CWS)
Research/ Data
Communi-cations
Influence/ Leadership
Enforcement/ Compliance
Migratory Birds Management
Habitat Management
Wetlands Management
Crop Loss Management
Flood Damage Reduction
Protection of Nat'l Int'l Water & Wildlife Interests
Water Quality & Supply Mgmt.
Endangered Species
Data and Research
• Increased scientific knowledge of resource conservation issues, problems and approaches
• Canadians informed of, and understand key resource conservation issues
• Canada and its international partners actively participated in, and support resource conservation
• Canadians comply with resource conservation objectives and legislation
• Migratory bird populations are sustained or increased
• Wildlife habitat is maintained or enhanced
• Endangered species are reestablished and rehabilitated
• Canada's access to international water/wildlife is maintained or enhanced
• Regional access to good quality water/wildlife resources is maintained or improved
• Damages resulting from natural hazards are reduced
• Conserve Canadian Natural Resources
Actors Influencing Strategies and Activities
Public Sector
• Provinces/Territories
• OGDs
• NGOs
• Int'l Organ.
Private Sector
• Industry
• Business
• Public
Factors Influencing Results
• Available public policy instruments
• Jurisdictional boundaries
• Industrial Pollution

Conservation and Protection accounts for approximately 54% of the total 1989-90 Environmental Services Program expenditures and 50% of the total person-years. Total resources are estimated to amount to $251.03 million and 2,382 person-years.

2.3 Natural Resource Conservation

Natural Resource Conservation is a sub-activity of the Conservation and Protection Activity. In terms of the Results Model, the Natural Resource Conservation sub-activity is designed to achieve the following key effects or results:

1.1 Migratory Bird Populations are Sustained or Increased

1.2 Wildlife Habitat is Maintained or Enhanced

1.3 Endangered Species are Reestablished and Rehabilitated

1.4 Canada's Access (Quality/Quantity) to International Water and Wildlife Resources is Maintained or Enhanced

1.5 Regional Access to Good Quality Water and Wildlife Resources is Maintained or Improved

1.6 Damages Resulting from Natural Hazards are Reduced

As noted above, the Natural Resource Conservation sub-activity programs are delivered primarily through the inland waters conservation activities of the Inland Waters Directorate (IWD) and wildlife conservation activities of the Canadian Wildlife Service (CWS). However, as can be seen from Exhibit 1, shown opposite, the ultimate achievement of Natural Resource Conservation goals depends on the cooperative efforts of various actors within C&P, as well as many other public and private sector organizations. In particular, the diagram illustrates that it is relatively easy to identify individual participants and their strategies and activities for achieving natural resource conservation. However, as indicated in the Results Measurement Project Report, attributing the relative impacts and effects of the various participants is a much more difficult task. Exhibit 1 shows some of the outside factors influencing results.

Viewing Natural Resource Conservation from another perspective we see that the program has significant information and communication program elements in order to achieve the desired conservation and protection activities. That is, the desired "Immediate Effects" follow a continuum of key results or effects. We begin with the production of scientifically reliable data. This is followed by the delivery of information and communication products and services to the desired target groups. In certain instances legislative and regulatory tools are also used. This then should provide a basis for managers and professionals to exercise influence and leadership, in order to have Canadians comply with natural resource conservation goals, objectives and legislation. This in turn leads to the achievement of the long-term conservation practices, environmental improvements and sustainable development required for the ultimate effect of conserving Canadian natural resources.

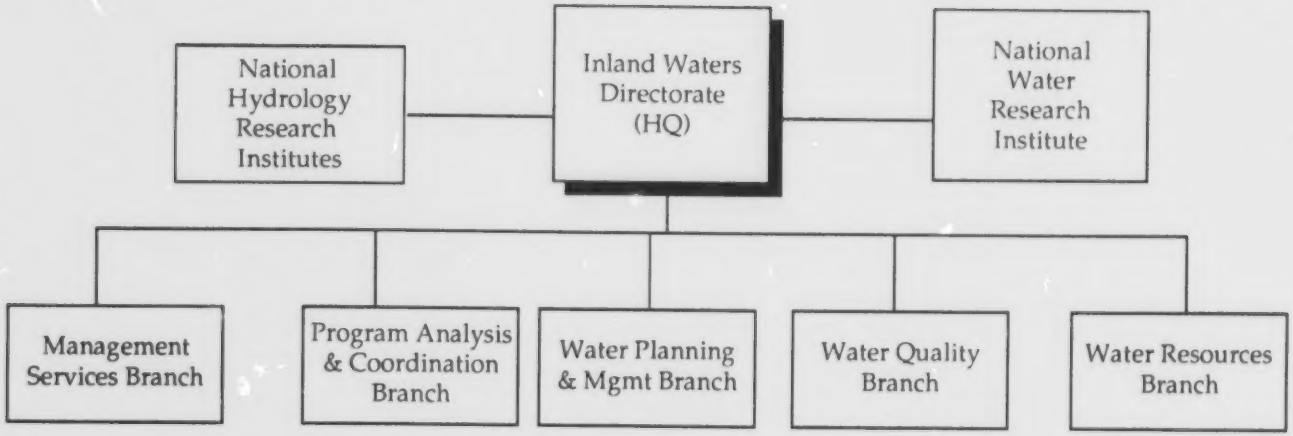
The model presented in Exhibit 1 is important because it shows that in order to properly evaluate Natural Resource Conservation one must evaluate the strategies, as well as the results.

In the following sections we describe the organizational units, IWD and CWS at Headquarters, and the C&P Regional Offices responsible for the delivery of the Natural Resource Conservation programs and activities.

2.4 Inland Waters Directorate

Canada possesses a large portion, about 9 percent of the world's renewable water supply. Canadians have grown accustomed to seemingly unlimited quantities of high quality water. The use of Canadian water resources is complicated by the fact that 60 percent of our freshwater drains north, while 90 percent of our population lives within 300 kilometres of our southern border. As a result, demands are heavy but the supplies are meagre in certain regions of Canada. In other areas, water that is plentiful often suffers chronic pollution problems. Canadians are beginning to recognize that an adequate supply of good quality water underpins the nation's economy. Water is used for transportation, the production of energy, recreation, agriculture, fisheries and, unfortunately, for waste disposal. Its contribution to the Canadian economy is estimated to range between $7.5 billion and $23 billion per year. Therefore, most Canadians accept that the careful management of water as a natural resource is economically wise, and likewise, that the protection of aquatic ecosystems is the key to achieving sustainable development.

EXHIBIT 2


National Hydrology Research Institutes
Inland Waters Directorate (HQ)
National Water Research Institute
Management Services Branch
Program Analysis & Coordination Branch
Water Planning & Mgmt Branch
Water Quality Branch
Water Resources Branch

Mandate

The Inland Waters Directorate meets federal responsibilities under the Canada Water Act, the Boundary Waters Treaty Act, the International River Improvements Act, the Lake of the Woods Control Board Act and Lac Seul Conservation Act. It administers 37 federal-provincial agreements negotiated under the Canada Water Act dealing with flood damage reduction, river-basin planning and implementation, and water quantity and quality surveying activities.

Aims and Objectives

The objective of the Inland Waters Directorate is to promote sound management and development of Canada's water resources by ensuring conservation, protection and enhancement to achieve sustainable benefits.

The C&P Long-Term Operational Planning Process requires that IWD plan its activities in relation to the desired environmental effects. As do the other Directorates, IWD contribute to all three sub-activities of C&P: Natural Resource Conservation; Environment - Economy Management; and Environmental Quality Protection. The following are the Natural Resource Conservation program areas to which IWD contributes.

1.2 Wildlife Habitat is Maintained or Enhanced

1.4 Canada's Access (Quality/Quantity) to International Water and Wildlife Resources is Maintained or Enhanced

1.5 Regional Access to Good Quality Water and Wildlife is Maintained or Improved

1.6 Damages Resulting from Natural Hazards are Reduced

Organizational Structure

Exhibit 2, shown opposite, presents the organizational chart of the Inland Waters Directorate (see Annex B for a detailed discussion of IWD components). The work of the Inland Waters Directorate (HQ) is carried out by the Water Planning and Management, Water Quality, Water Resources, Program Analysis and Coordination, and Management

Services Branches located at headquarters. In addition, two research institutes - the National Hydrology Research Institute (NHRI) in Saskatoon, and the National Water Research Institute (NWRI) in Burlington - comprise the research components of the Directorate.

For fiscal year 1990-91 IWD at Headquarters (including the research institutes) have been allocated the following A-Base resources: 530.7 person-years and $41,018,100. Of this 289 person years (55%) and $19,842,500 (48%) will be directly expended on Natural Resource Conservation activities.

Activities and Outputs

The resources of the Inland Waters Directorate are expended on a number of Natural Resource Conservation activities resulting in a wide variety of products and outputs. The IWD Long-Term Operational Plans for 1990 -1994 describe major Natural Resource Conservation initiatives in terms of the key environmental improvement effects outlined in the C&P Results Model for the Natural Resource Conservation Sub-activity. They are as follows:

1.2 Wildlife Habitat

Managing and maintaining water quality is linked in a complex way with the health and diversity of aquatic species. Continuing economic development in Western Canada by agriculture and industry has reduced the area of wetland and the habitat for wildlife. These wetlands are also affected by drought and climate change. All these can seriously reduce the wetlands and result in demands for ground water withdrawals to provide water for the drying wetlands. Studies are focused on the relationship of ground water to prairie sloughs and to possible amelioration measures. Major initiatives of IWD over the next 4 years to maintain or enhance wildlife habitat include:

- Undertaking studies and providing information on ground water processes relevant to maintaining water levels in prairie wetlands used by wildlife; and

- Initiate a study in collaboration with CWS and AES on hydrology of wetlands and implications of drainage.

1.4 International Water and Wildlife Resources

Effective management of Canadian waters which cross international boundaries is a continuing challenge. Working within the jurisdictional constraints, IWD provides information, advice and policy development to resolve conflicts and assist in the wise management of the water. Major initiatives of the IWD over the next 4 years to ensure Canada's access to international water and wildlife include:

- Strategies designed to meet the program objectives through support for cooperative agreements with the U.S. through the IJC, for example: research on critical or emerging issues, including climate change and contaminated sediments; scientific advice and leadership in the development of Remedial Action Plans in Canadian IJC Areas of Concern; water quality and quantity monitoring and analytical services; publication of interpretive reports and promotion of water quality and quantity objectives.

- To meet multilateral commitments, technology transfer and training are emphasized, as well as provision of technical services and participation in water activities with international agencies such as the EEC, WMO and WHO.

1.5 National/Regional Water and Wildlife Resources

River systems crossing provincial or territorial boundaries create jurisdictional constraints on their effective management. IWD provides data, information, advice and policy development to ensure effective management of the resource.

To meet the program objectives, strategies are designed utilizing cooperative agreements and joint programs with the provinces and territories, to ensure that broad national and regional perspectives are brought to bear on issues such as competing uses and jurisdictions. Major initiatives of IWD over the next 4 years to ensure that regional access to good quality water and wildlife resources is maintained or enhanced include:

- Completion of negotiations to have in place federal/provincial water quality monitoring agreements and equivalent arrangements with all ten provinces and the territories. Once the agreements are operational, attention will focus on network design, quality control, data storage and retrieval and program coordination;

- Manage and operate cost-shared federal/provincial hydrometric agreements which provide for the collection and dissemination of hydrometric and sediment data used in policy setting, planning, design and operation of water-related infrastructure, as well as to respond to environmental issues such as climate change and water quality degradation. Demands for the extensive use of new technologies to address increasingly complex water-related issues are being met through a Modernization Strategy that will include implementation of electronic data acquisition system in a major pilot area and the operation of three Direct Read-Out Ground Receive Stations for real-time data and up-to-date computer systems;

- Continue site-specific research to contribute knowledge and expertise to the three C&P priority basin actions plans - the St. Lawrence, Fraser and Mackenzie (Athabasca Rivers). Generic research into lake remediation methods, predictive simulation models and expert computer systems (for basin planning and management) and analytical methods and QA/QC for water monitoring, will respond to the increasing national demand in these areas;

- Develop an understanding of changes in the nature of water resources due to the impact of human activities. Two research programs - "Hydrological Processes and Climate Change" and "Man's Interaction with the Hydrologic Cycle" will be carried out to determine the potential impact of climate change on the hydrologic cycle and to give a better understanding of how human interaction with the hydrologic cycle is linked to our ability to manage the water resource nationally.

- To meet the federal government's responsibility for activities in the North and to benefit from its economic potential for hydroelectric development and resource industries, research in "Northern Water Systems" will be carried out to provide improved knowledge of hydrologic processes in northern environments, so as to effectively balance its environmental and economic development.

- Information that becomes available under the National/Regional resources will contribute to State of the Environment reporting, both departmental and sectoral, to the CEPA and public awareness program, and also support directly or indirectly, the implementation of the Federal Water Policy.

1.6 Natural Hazards

Major initiatives of IWD over the next 4 years to reduce damages resulting from natural hazards include:

- Through a combination of structural and non-structural approaches, the federal-provincial Flood Damage Reduction (FDR) program continues to encourage the control and eventual reduction of these flood disaster assistance payments. Redirection of development is encouraged by the mapping of flood-prone areas and the placing of restrictions on government support for development in those areas. Forecasting and warning systems, flood-protection, land use planning and land acquisitions are considered along with structural works to protect existing development; and

- Reducing the damages from natural hazards such as, ice-jam formation, flooding and coastal erosion by increasing knowledge on the processes involved in controlling these natural hazards. A moderate level of research will be carried out at NWRI into ice jamming processes, ice-modelling, ice-jam/flooding modelling and coastal/fluvial hydraulics, with a joint multi-agency Canadian River Ice Model planned for 1992.

Clients/Stakeholders/Partners

In providing national leadership to ensure that Canada's freshwater management is in the national interest, the IWD actively promotes a partnership approach among the various levels of government and private sector interests which contribute to, and benefit from, the wise management and sustainable use of water resources. The following is a listing of a number of the major clients, stakeholders and partners of the IWD.

Federal Partners

- Fisheries and Oceans (fisheries and habitat protection, coasts and estuaries)
- External Affairs (bilateral relations between Canada and the U.S., and multi-country international activities)
- Agriculture Canada (Prairie Farm Rehabilitation Administration and irrigation issues)
- Health and Welfare Canada (drinking water quality)

- Indian and Northern Affairs (resource management in the Northwest Territories and the Yukon Territory, and Native land claims negotiations)
- Transport Canada (navigable waters, harbours)
- Energy, Mines and Resources (hydroelectric energy production)

Provincial and Territorial Partners

- Ministries of the Environment and/or Natural Resources from all the provincial and territorial governments/Conservation authorities

- Provincial hydroelectric management agencies, such as Ontario Hydro and Hydro Quebec
- Provincial Water Management Boards

International Partners

- Environmental Protection Agency (U.S.)
- Environmental and natural resource agencies of the various State governments that border on Canada
- Multinational organizations (UNEP, UNESCO, WMO)
- United States Geological Survey - Water Resources Division

Municipal Government Partners

- Representatives of local and municipal governments on particular regional water management and quality issues
- Canadian Association of Municipal Administrators

Private Sector Partners

- Privately owned hydroelectric power companies
- Engineering, science and technology consulting firms

Universities

- Researchers located in water quality, quantity, management and environmental policy programs in universities throughout the country

NGOs/ENGOs

- Rawson Academy of Water Science
- Canadian Water and Wastewater Association
- Canadian Water Resource Association

Threats and Opportunities

In our discussions with program management personnel, we asked them to comment on the major threats and/or opportunities facing the IWD. The following is a brief synopsis of the findings.

Adequacy of Data Collection Methods

The department is placing increased emphasis on anticipating and preventing environmental problems, as opposed to reacting to them and curing them. Resource management and increased environmental issues have increased the need for standardized, accurate and timely data for sound water management decisions and for trend and scenario analysis. This change in emphasis provides a tremendous opportunity to be at the forefront in providing integrated ecosystem data to numerous internal and external clients. Unfortunately, at the same time as this opportunity presents itself, IWD managers are concerned about their ability to provide an adequate service. Their concerns are focused primarily in two areas. First, the lack of hydrometric gauging stations, particularly in the North. There are also large gaps in the networks that are needed to provide baseline data prior to major projects being developed and to describe the regional hydrologic characteristics. Second, if the Water Resources Branch is to respond to demands for more timely and integrated data collection systems, it will necessitate the overhaul of the existing gauging station technology, and its replacement by a more technologically advanced system.

Appropriate Level of Resources

The area of concern here relates to the Directorate's ability to ensure that the appropriate level of resources are available to implement their program. Of particular concern is the ability of the IWD to obtain new resources for some of its more routine, but important, tasks. The concern is that because these activities are not currently of high profile,

resources may be shifted towards short-term crisis or "hot" issues.

Impacts of CEPA Implementation

There is widespread acknowledgement that the implementation and operationalization of CEPA and the establishment of Administrative and Equivalency Agreements with the provinces will impact on the workload of the IWD. However, since no agreements have been signed with the provinces, the actual impact cannot be accurately predicted. The implementation of CEPA will have varying regional implications for IWD, since some provinces are better able to provide the enforcement and monitoring functions required by CEPA than others. The current belief is that in some provinces IWD will play a significant role in providing monitoring and enforcement services.

Ability to Meet Water Research Needs in Canada

The federal government plays a unique and important role in terms of scientific water research in Canada. Although the provinces have responsibility for the management of significant Canadian water resources, their research efforts have been directed primarily towards operational aspects, rather than science-related research. Consequently, the federal government currently conducts approximately seventy percent of all water research in Canada. This necessitates that the IWD play a dominant leadership role in water research in Canada. Consequently, there is a real threat to Canadian water research if the IWD is not able to continue to provide longer term scientific research.

Increased Cost of Conducting Science Research

Fiscal restraint, combined with the increased cost of the technology required to undertake advanced scientific research impacts on IWD's ability to conduct water-related research up to international standards. These problems are exacerbated by the increasing percentage of the research dollar which goes to overhead. In response to these problems IWD has undertaken a deliberate strategy of forging close ties with the international water research scientific community.

Groundwater Contamination

Approximately fifty-eight percent of the water utilized in Canada originates from groundwater resources. In some areas, PEI for example, the utilization of water from

groundwater resources is close to one-hundred percent. The threat results from the fact that relatively speaking, it is much cheaper to protect groundwater through regulations, than it is to clean-up. In fact, in many cases it is practically impossible to clean-up contaminated groundwater. The opportunity is to prevent future groundwater contamination problems by undertaking conservation and protection activities immediately.

2.5 Canadian Wildlife Service

The results of a national survey found eighty-five per cent of Canadians expressed a direct and active interest in, or interaction with, wildlife. These findings indicate there is a high degree of both commercial and recreational use of wildlife resources, in this country. The activities of Canadians result in an annual expenditure of $4.2 billion and the existence of 185,000 jobs. The Canadian Wildlife Service has historically enjoyed high public recognition, due to such successful media campaigns as the "Hinterland's Who's Who" series. Currently, there is a heightened national and global awareness of ecological and environmental issues. As a result, the climate is favourable for a continued and strengthened Canadian Wildlife Service.

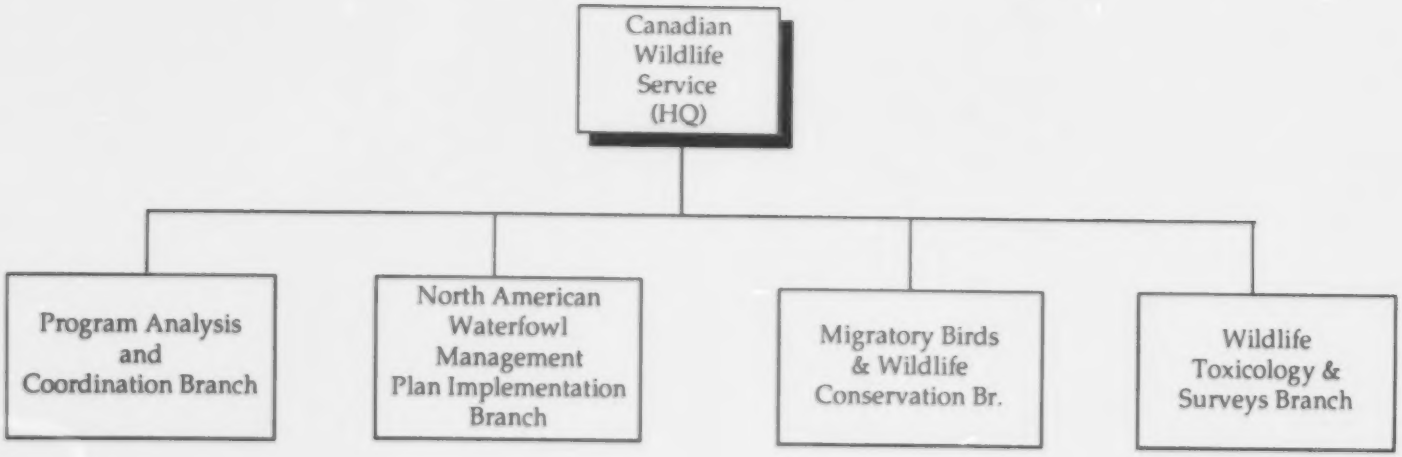
Mandate

The Canadian Wildlife Service meets federal responsibilities under the Migratory Birds Convention Act, the Canada Wildlife Act and the Game Export Act, in addition to 32 major international and federal-provincial agreements. CWS will also undertake certain responsibilities with respect to the Canadian Environmental Protection Act (CEPA). The wise use and sustainability of wildlife resources represents the conservation aspect of the CWS.

Aims and Objectives

The objectives of the Canadian Wildlife Service are designed to promote wildlife conservation. The maintenance or enhancement of populations of migratory birds and other wildlife is the Service's key objective. The conservation of wildlife habitats is a key factor in achieving these goals and, as a result areas, identified as critical to the survival of wildlife are targeted for securement, maintenance and enhancement. CWS is also the key federal body responsible for the protection of endangered species. The Service contributes towards the derivation of sustainable benefits from wildlife. Another aim is the promotion of environmentally-sound usage and management of Canada's land resources.

EXHIBIT 3


Canadian Wildlife Service (HQ)
Program Analysis and Coordination Branch
North American Waterfowl Management Plan Implementation Branch
Migratory Birds & Wildlife Conservation Br.
Wildlife Toxicology & Surveys Branch

The C&P Long-Term Planning Process requires that CWS plan its Natural Resource Conservation activities in relation to the achievement of desired environmental effects. The following are the Natural Resource Conservation program areas to which CWS contributes.

1.1 Migratory Bird Populations are Sustained or Increased

1.2 Wildlife Habitat is Maintained or Enhanced

1.3 Endangered Species are Reestablished and Rehabilitated

1.4 Canada's Access to International Water and Wildlife is Maintained or Enhanced

1.5 Regional Access to Good Quality Water and Wildlife Resources is Maintained or Enhanced

Organizational Structure

Exhibit 3, shown opposite, illustrates the organizational structure of the Canadian Wildlife Service (see Annex C for a detailed discussion of CWS components). The work of the CWS is carried out by the Migratory Birds and Wildlife Conservation, Wildlife Toxicology and Surveys, North American Waterfowl Management Plan Implementation and Program Analysis and Coordination branches located in the National Capital Region.

For fiscal year 1990-91 CWS at Headquarters have A-Base resources of 95.2 person-years and a budget of $11.929,200. Of this 50.7 pys (53%) and $6,966,100 (58%) of the total CWS resources will be directly expended on natural resource conservation activities.

Activities and Outputs

The resources of the Canadian Wildlife Service are expended on a wide variety of Natural Resource Conservation activities resulting in a range of products and outputs. The CWS Long Term Operational Plans for 1990 - 1994 describe major Natural Resource Conservation initiatives in terms of the key environmental improvement effects outlined in the C&P Results Model for the Natural Resource Conservation Sub-activity. They are as follows.

1.1 Migratory Birds

Migratory Birds are susceptible to external pressures, such as adverse climatic conditions (eg. drought in the prairie provinces), over-harvesting, habitat degradation or loss, disease, impacts from toxic chemicals and pesticides, and acid rain, both within Canada and in other countries. Canadians share an intrinsic concern for good management of our natural resources. In addition, migratory birds have significant impacts on both subsistence and recreation-based economies, and are excellent indicators of environmental health. The sustainability of natural resources has become a global priority. Major initiatives of CWS over the next 4 years to sustain or increase population levels of migratory birds include:

- o Implementing the Canadian and continental long-term plans for the North American Waterfowl Management Plan (NAWMP) and its joint ventures to address the serious decline in waterfowl populations. This will involve:
  - coordination of existing Joint Ventures and incorporation of the new Pacific Joint Venture;
  - identification, protection and conservation of significant waterfowl habitat under the existing Prairie Habitat, Arctic Goose, Black Duck and Eastern Habitat Joint Ventures;
  - research and monitoring of waterfowl populations as to better manage the resource, including the establishment of the Eastern Canadian Duck Survey Program in support of the Black Duck Joint Venture;
  - first revision of NAWMP, with modifications incorporated into implementation strategies and plans; and
  - implementation of nationally and internationally coordinated evaluation systems to ensure maximum effectiveness of NAWMP activities.
- o Developing, coordinating and enforcing annual game bird hunting regulations.
- o Addressing the problem of lead shot poisoning of waterfowl through the phased in establishment of "non-toxic" zones, with all priority areas zoned by 1993-94 and incorporated into annual game bird hunting regulations.

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- Improving and amending the Migratory Birds Convention Act (MBCA) and Canada Wildlife Act (CWA) to provide for increased penalties and improved administration; and developing and implementing compliance and enforcement policies for MBCA and CWA.

- Providing coordination and assistance in the development of cooperative migratory bird management accords with provinces (accords with Manitoba and Saskatchewan in 1990-91); and the establishment of the Western Canadian Waterfowl Advisory Committee as a functional mechanism for management of game birds in western Canada.

- Placing increased emphasis on the monitoring and research of eastern Canadian waterfowl (to complement western surveys), arctic geese, shorebirds and seabirds in order to determine population trends and to identify management priorities. Research and monitoring of non-game birds will be increased, with reference to major land use and climactic factors, and to the status of uncommon or declining species, to assist in determining management priorities and to contribute to State of the Environment Reporting. Major initiatives include:

  - implementation of the Eastern Canadian Duck Survey
  - developing and implementing a songbird conservation strategy
  - implementation of an integrated survey and monitoring plan for songbirds and biennial production of status reports.

- Increasing research efforts on the effects of climate change on migratory bird populations, including the preparation of a report on possible impacts on arctic shorebirds.

1.2 Wildlife Habitat

Wildlife habitat is under severe and increasing stress from climate change, degradation or loss from land use conversion, and the impact of toxic chemicals and acid rain. Continued loss of habitat will have significant socio-economic implications. The trend that has been established can only be countered through the combined efforts of all governments, agencies and organizations, and individual Canadians. The quality and quantity of habitat depend on how well our land and water resources are managed now and in the future.

Worldwide concern about the state of natural resources and our ability to sustain future development have made conservation and protection of habitat a priority. There is considerable public and private sector support for building habitat management concerns into the main stream of the economic decision-making process in Canada and other countries.

Major CWS initiatives over the next 4 years to maintain or enhance the wildlife habitat include:

- o Completion and implementation of the CWS/Federal Habitat Conservation Strategy to increase the effectiveness of habitat programs by identifying goals, directions and mechanisms for conservation of wildlife habitat; and the development and implementation of a Habitat Systems Plan for the establishment of a network across Canada of protected areas identified as critical to wildlife.

- o Improved Habitat Conservation and Protection through the:

  - implementation of NAWMP;
  - implementation and support of the Federal Policy on Wetlands Conservation;
  - identification and establishment of areas of unique or exceptional importance to wildlife and implementation of appropriate mechanisms for their protection (National Wildlife Areas and Migratory Bird Sanctuaries); and
  - establishment of other NWAs/MBSs and designation of RAMSAR sites and Western Hemispheric Shorebird Reserves, according to the Habitat Systems Plan.

- o The development of guidelines for negotiation of cooperative management agreements for protection of wildlife habitat on lands belonging to OGDs; and the development and implementation of MOUs with OGDs for habitat protection;

- o Continue the monitoring and targeting of habitat critical to wildlife in support of NAWMP and other habitat conservation and protection initiatives. Shorebird habitat initiatives include:

  - the identification and protection of significant shorebird habitat in Canada through preparation of reports on key migration sites for shorebirds; and the development of a program to identify key arctic breeding areas for shorebirds.

1.3 Endangered Species

The number of Canadian species categorized as extinct, extirpated, threatened or vulnerable has been rising steadily and is currently over 180. The federal government under its commitment to the World Conservation Strategy, is responsible for preserving genetic diversity in wildlife populations by supporting programs to understand, protect and rehabilitate threatened species. This can be achieved most effectively through cooperative efforts with provincial/territorial governments and non-government organizations. The establishment of a cooperative national recovery strategy (RENEW) and an Endangered Species Recovery Fund (ESRF) in 1988, together with heightened public awareness and priority placed on species conservation provide an excellent opportunity for progress in this area. Major CWS initiatives over the next 4 years for the protection and recovery of vulnerable, threatened and endangered species include:

- o The development and implementation of a CWS policy on threatened and endangered species which will identify goals, priorities and mechanisms for endangered species recovery; and the development of a federal strategy on endangered species to coordinate federal action in endangered species protection and recovery;

- o Implementing cooperative activities for the Recovery of Endangered Species through:

  - coordination of CWS input to RENEW for decisions involving establishment of recovery teams, development of recovery plans and provision of Secretariat functions;
  - completion of recovery plans and establishment of recovery teams for all threatened and endangered species of migratory birds;

- provision of Secretariat functions to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and coordination of the release of status reports on endangered, threatened and vulnerable wildlife species;
- implementation of the Endangered Species Recovery Fund with the World Wildlife Fund (Canada) to support research and other activities associated with the recovery of endangered wildlife; and
- provision of national coordination of the Whooping Crane and Piping Plover recovery teams.

1.4 International Wildlife Resources

The trans-boundary nature of many species, the illicit harvesting and international trade of endangered species, and the global ramifications of habitat loss and destruction, and pollution require international cooperation for sustainable resource management. Major CWS initiatives over the next 4 years in the conservation of international wildlife resources include:

o The submission of the Wild Animal and Plant Protection Act to Parliament and its subsequent implementation;

o The implementation of the International Strategy as a basis for assuming a leadership role and a proactive approach in resolving international wildlife/habitat issues;

o The development and implementation of agreements and action plans with circumpolar countries for protection of shared species and the establishment of a network of reserves; and the development of a strategic plan for the Mexico/Canada/U.S. MOUs on the conservation of migratory birds; and

o Development, participation and/or implementation in the following international conventions:

- RAMSAR Conference (1990)
- CITES Conference (1992)
- Western Hemispheric Convention
- Convention on Biodiversity

1.5 Regional/National Wildlife Resources

Both regional and national perspectives need to be considered in wildlife management. Federal provincial/territorial, public and native groups' roles in the management of wildlife must be defined and carried out in such a way as to ensure the sustainability of these resources while providing fair access to them. CWS initiatives over the next 4 years to provide effective management of national and regional wildlife, and ensure fair access to these resources include:

- o Development of a Protocol to amend the Migratory Birds Convention Act (MBCA) by:
  - establishing a Canadian position on the Protocol;
  - obtaining U.S. agreement on the Protocol;
  - amending the MBCA; and
  - implementing the revised agreements.
- o Ensuring that wildlife and habitat concerns are addressed in Native Land Claims negotiations by providing expertise to the Department of Indian Affairs and Northern Development on negotiations for the settlement of land claims with Dene-Metis, TFN, CYI, LIA and CAM;
- o Completing and implementing CWS policy and guidelines on native affairs to address shared wildlife and habitat concerns;
- o Coordinating federal, provincial and NGO activities for National Wildlife Week;
- o Developing new opportunities for cooperative wildlife research centres in the regions.
- o Establishing a Cooperative Wildlife Health Laboratory at the University of Saskatchewan.

Clients/Stakeholders/Partners

The Canadian Wildlife Service has a long and successful history of forging partnerships in both public and private sectors. The commercial, as well as recreational, wildlife user has

been represented on client, partner, and stakeholder lists. The Canadian public may be deemed to be the ultimate client with many special interest groups contained therein experiencing a greater degree of involvement in the formulation of CWS activities. Bird watchers, hunters, hikers, tourists, and recreation industry operators are formally represented by name organizations with the key national ones being the Canadian Nature Federation, Ducks Unlimited, the Canadian Wildlife Federation, Wildlife Habitat Canada, the World Wildlife Fund, Canadian Council on Ecological Areas, Committee on the Status of Endangered Species and the Nature Conservancy of Canada. Other government departments and agencies, universities, and provincial and municipal governments are additional members of this category.

Several programs involve a myriad of partners and stakeholders. The North American Waterfowl Management Plan involves Canadian and U.S. federal and provincial/state governments, as well as major private conservation organizations. NAWMP with an estimated budget of $1 billion over 15 years (federal contribution $100 million), is not managed directly by the CWS, however, all project efforts are coordinated by Joint Venture Committees which are chaired by CWS members. Examples of such joint ventures include the Prairie Habitat, Eastern Habitat, Arctic Goose, Black Duck and the proposed Pacific Habitat Joint Ventures. These broad and costly programs simply could not be completed without the support of partners.

The CWS interacts with international clients/partners/stakeholders through existing wildlife related agreements such as:

- the Convention on International Trade in Endangered Species;
- the RAMSAR Convention on Wetlands of International Importance;
- the Latin American Program;
- the Mexico/Canada/U.S. MOU on migratory birds;
- the Agreement on the Conservation of Polar Bears; and
- the Porcupine Caribou Herd Management Agreement.

Threats and Opportunities

Enforcement is one of the activities CWS performs to meet its overall responsibility of protecting and managing migratory birds. Enforcement of the Migratory Birds Convention Act constitutes the major portion of CWS enforcement. There has been heavy criticism levied on this role in relation to both CITES and the Migratory Birds Convention

Act. The criticism is primarily the result of a lack of resources available for enforcement both within CWS and from enforcement agencies such as the RCMP. A review of the enforcement of wildlife regulations undertaken for C&P suggested that there is a need for additional resources to be devoted to enforcement, and that roles and responsibilities between the various agencies involved in enforcement be more clearly defined. Regionally the CWS obtains valuable feedback from their enforcement partners. Good channels of communication have combined with long-standing involvement in facilitating this scenario.

In addition to the national threats and opportunities, the Ontario, Atlantic, Pacific and Yukon, and Quebec regions experience greater enforcement problems. Toronto, Halifax, Vancouver, and Montreal are the major Canadian ports of entry for illegal trading in wildlife falling under CITES. At present, Customs and the RCMP have enforcement roles while the CWS is an administrative entity. Since the identification expertise resides within the CWS, greater education and support for the actual enforcement agencies are required for adequate CITES enforcement.

2.6 Regional C&P Offices

Mandate

Regional C&P Offices meet federal responsibilities for the delivery of Natural Resource Conservation programs for water and wildlife under the Canada Water Act, the Boundary Waters Treaty Act, the International River Improvements Act, the Migratory Birds Convention Act, the Canada Wildlife Act and the Game Export Act. In addition, the Regional C&P Offices are responsible for administering relevant federal-provincial agreements negotiated under the Canada Water Act dealing with flood damage reduction, river basin planning and implementation, and water quantity and quality surveying activities.

Aims and Objectives

The objectives of Regional C&P Offices are to promote the sound management and development of Canada's water and wildlife resources by ensuring conservation, protection and enhancement to achieve sustainable development.

The C&P Long-term Planning Process requires that Regional C&P Offices plan their Natural Resource Conservation activities in relation to the achievement of desired environmental effects. Regional C&P Offices contribute to the following program areas:

1.1 Migratory Bird Populations are Sustained or Increased

1.2 Wildlife Habitat is Maintained or Enhanced

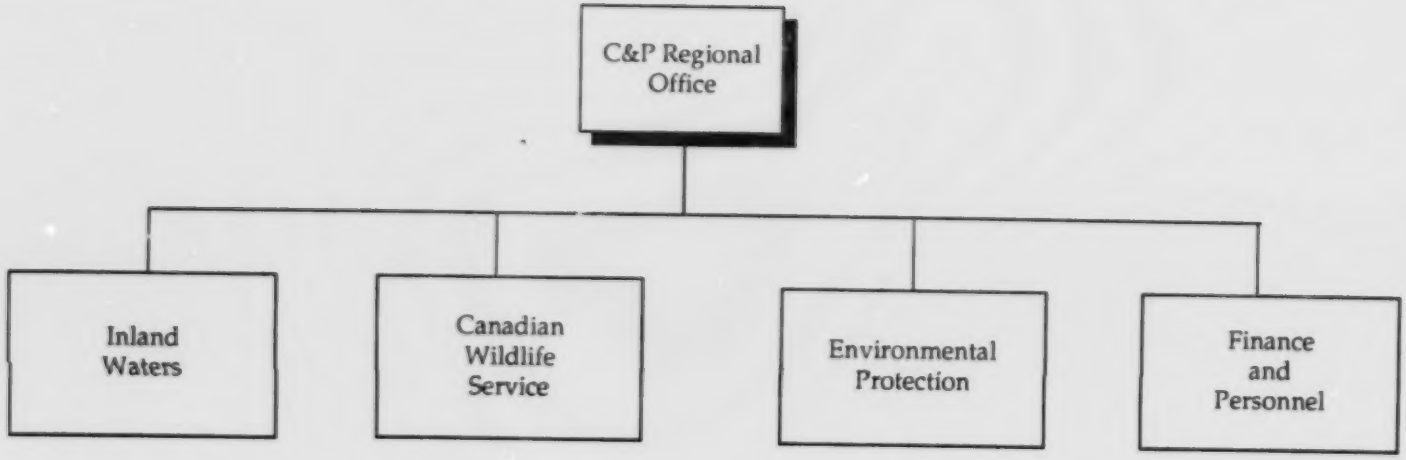
1.3 Endangered Species are Reestablished and Rehabilitated

1.4 Canada's Access to International Water and Wildlife is Maintained or Enhanced

1.5 Regional Access to Good Quality Water and Wildlife Resources is Maintained or Enhanced

1.6 Damages Resulting from Natural Hazards are Reduced

EXHIBIT 4


C&P Regional Office
Inland Waters
Canadian Wildlife Service
Environmental Protection
Finance and Personnel

Organizational Structure

Exhibit 4, shown opposite, illustrates the organizational structure of a typical Regional C&P Office. Each of the C&P program directorates (IWD, CWS and EPD) have a line reporting relationship with the Regional Director-General. In addition, they receive functional guidance from their respective Headquarters directorate.

For fiscal year 1990-91 the Regions have been allocated the following A-Base resources:

- Pacific and Yukon - 254.2 person-years and $17,701,700
- Western and Northern - 401 person-years and $27,800,000
- Ontario - 199.2 person-years and $16,476,600
- Quebec - 161.5 person-years and $28,511,200
- Atlantic - 2219.7 person-years and $17,917,200

Of these regional resources the following are directly expended on Natural Resource Conservation activities:

- Pacific and Yukon - 124.1 person-years (49%) and $8,513,200 (48%)
- Western and Northern - 245.77 person-years (61%) and $17,312,800 (62%)
- Ontario - 111.65 person-years (56%) and $10,566,500 (64%)
- Quebec - 42.9 person-years(27%) and $7,508,500 (26%)
- Atlantic - 77.3 person-years (35%) and $4,682,700 (25%)

Activities and Outputs

The resources of the Regional C&P Offices are expended on a wide variety of activities resulting in a variety of products and outputs. Below we provide a synopsis of the major initiatives of each Region for the next four years, as they relate to the Natural Resource Conservation program areas.

Pacific and Yukon Region

1.1 Migratory Birds

- More emphasis will be placed on increasing the efficiency and effectiveness of our regulations and enforcement efforts. Security of the migratory birds using the

internationally important Boundary Bay area will be addressed through a joint, multi-government sustainable development study. The development of a Pacific Joint Venture under NAWMP is a priority to ensure proper management of waterfowl populations. There will be a renewed focus on the effects of forest management on migratory bird populations. Key baseline information on the status of migratory bird populations will be gathered through completion of "Birds of B.C." and initiation of "Birds of Yukon".

1.2 Wildlife Habitat

- A plan identifying critical wildlife habitats in P & Y Regional, and a strategy for securing those areas, will be developed. Cooperative conservation of wildlife habitat through undertakings with the Governments of British Columbia and Yukon, and non-governmental organizations as Ducks Unlimited, Wildlife Habitat Canada, and the Nature Trust of British Columbia will be emphasized. Efforts to ensure conservation of habitat for migratory birds will be pursued with these agencies, particularly for estuaries in British Columbia and key migratory bird habitats in Yukon. CWS will continue to conduct research on habitat needs and capabilities, and improvements to sustain wintering waterfowl populations. New thrusts are underway to document land-use changes in interior B.C., and to develop strategies to maintain "no net loss" of important wildlife habitats, given anticipated patterns of sustainable development. Habitat concerns will be incorporated in the Pacific Joint Venture being developed.

1.4 International Water and Wildlife Resources

- The international wildlife effort will concentrate on the critical habitats on the North Slope of Alaska and Yukon, and on the implementation of the Canada and U.S agreement on conservation of the Porcupine Caribou Herd. As well, work will continue in Panama towards conservation of Western Sandpipers and their wintering habitat.

- Monitoring and evaluation of the water quality conditions at the International border, in the context of the Boundary Waters Treaty, will remain a high priority,

particularly on the Columbia River. The development of water quality objectives in cooperation with B.C. will be emphasized. Recent mining developments along the Alaskan border and the southern boundary will necessitate increased input to impact assessments, as well as surveillance activities.

1.5 Regional/National Water and Wildlife Resources

- Regional ground water capability will be increased to trans-boundary concerns such as Sumas and Okanagan Rivers contamination; the Federal-Provincial study of the ground water resources in the Abbotsford aquifer; and water quality objectives work will remain constant over the next four years. Resources have been increased for increased workload associated with operation of the hydrometric survey network. Extension of the sediment budget studies for the Lower Fraser River will be evaluated for continuation under contract funding.

- Planning toward development of a Federal-Provincial Accord for the Fraser River Basin that will consider the extension of the Fraser River Estuary Management Plan (FREMP) agreement will require redirected effort.

- Assessment of the long-range changes in the Region's hydrologic characteristics resulting from climate changes is a new priority requiring some resources.

- An agreement similar to the Canada/B.C. Water Quality Monitoring Agreement is being negotiated with the Yukon, to provide water quality data and interpretation to the Territory.

- A Yukon-Alaska Basins Agreement involving Canada, B.C. and the Yukon will address the inter-jurisdictional water management problems originating in the Yukon headwater lakes.

1.6 Natural Hazards

- The background associated with the impact of global climate change and the effect of sea-level increases on dyking levels will be examined.

Western and Northern Region

1.1 Migratory Birds

- Increased CWS enforcement capacity provided together with the new procedures with the RCMP and provinces will result in improved Migratory Birds Act and Canada Wildlife Act enforcement.

- While increasing field delivery of enforcement and administration in Alberta, Saskatchewan and Manitoba through implementation of the Accords, CWS will continue to lead and improve the overall coordination of training of provincial resource survey staff which will allow new geographic areas and projects to be incorporated. These new arrangements will contribute to evaluation of NAWMP through surveys and monitoring. The lead role for research will link across the three provinces and relate to NAWMP and the broader ecosystems emphasis. Regional resource harvest strategies will be developed to link with international goals and objectives.

- The NAWMP funding of the Arctic Goose (ACJV) and Prairie Habitat (PHJV) Joint Ventures will facilitate acquisition of essential baseline resource data and contribute to integrated land use planning as well as enhance efforts directed at sustainable development.

- The Region will develop and maintain a state of preparedness and response capability to prevent or mitigate damage to wildlife and habitat in the event of a spill.

1.2 Wildlife Habitat

- NAWMP, a high C&P priority, will require over 80 percent of its delivery within the region. Creative and imaginative programs will be required to generate the estimated 1 billion dollar expenditure required for delivery over its 15 year term. Complementary programs concerned with soil and water conservation, agricultural land productivity, tourism and NGO contribution will be utilized to lever the USA and Canadian resources required. The PHJV will demonstrate the value of sustainable development, the principles of E/E and generate a contribution to economic renewal. A significant internal and external communications effort will

be implemented. Organizational realignment to enable delivery will be undertaken.

- Research priorities are being adjusted to fulfil Canada's obligations to the NAWMP to evaluate the impact of habitat changes on non-target and non-game species and thus advance ecosystem knowledge, as well as the broad base of wildlife economics. Participation in the implementation of the PCAC will help ensure a coordinated approach to habitat conservation through Prairie Canada. An additional focal point will be to develop new cooperative research on disease impact prevention and control.

- There will be increased use of remote sensing technology as a cost-effective approach to offset py shortfalls for field studies and thus supplement fieldwork in identifying important habitats. Significant increases in the use of new technologies, including remote sensing and the SPANS systems, are foreseen.

- Canada has played a leading role in designating shorebird reserves as part of the Western Hemisphere Shorebird Reserve Network (WHSRN). Identification of potential Hemisphere Reserves in South and Central America and in the regions will be enhanced. As survey results accumulate, emphasis will shift from surveys (identifying important sites) to research (understanding why sites are important). Results of this work will contribute substantially to understanding effects of climate change and drought on migratory bird populations and their habitats. Increased emphasis will also be placed on identifying important breeding sites and habitats of shorebirds in the Arctic and Prairies. These thrusts will complement both the Arctic Goose and Prairie Habitat Joint Ventures of NAWMP, to ensure that enhancements of waterfowl populations also contribute positively to conditions for shorebird populations. Participation in the implementation of PCAP will help ensure a coordinated approach to prairie ecosystem maintenance in Canada.

- Securement of essential habitat, including marine environments, in the Arctic and other northern regions will be obtained through increased coordination with Western Arctic Inuvialuit Claim, as well as with other organizations involved in active participation in new claims under negotiation. Increased representation on management committees and influence on land use planning will be pursued.

1.3 Endangered Species

- In promoting the protection and maintenance of ecosystems increased efforts will be made in public education, research and improved cooperation between all landowners and managers. CWS will continue in the effort to develop new cooperative mechanisms for cost sharing partnerships and client support on a formal basis so that ecologically sound land use ethics become increasingly practised.

- In concert with the Recovery of Nationally Endangered Wildlife (RENEW) program, recovery teams will be set up for endangered species according to priorities developed regionally by the RENEW Committee. Increased opportunities for the involvement of NGOs will be sought while CWS will provide increased leadership in recommending priorities, forming multi-agency recovery teams and coordinating recovery plan implementation.

- Public education efforts to enhance environmental quality awareness will continue to be a high priority with the success or failure of endangered species being more readily recognized as an indicator of ecosystem health and sustainable development. Research to determine causes of species declines and habitat requirements for endangered species will continue along with re-introduction programs where feasible.

- CITES training and coordinated implementation of trade in endangered species, as well as wildlife generally will commence on passage of the Wild Animal and Plant Protection Act (WAPPA) and resourcing.

1.4 International Water and Wildlife Resources

- Enhanced research and monitoring of Arctic species such as seabirds, Arctic shorebirds and polar bears will ensure sustainable harvests are not exceeded and enable establishment of good baseline data to serve as a measure of resource use as well as an indicator of both industrial development impact and the state of the marine environment, while strengthening the link of Arctic well-being to southern benefits through establishing an increased Canadian interest in Arctic off-shore regions.

- Cooperative studies with foreign workers will be conducted under the WHSRN, NAWMP and Latin American Program (LAP) to help identify sources of contamination and other threats to wildlife resources and related benefits leading to increased awareness of these problems and their resolution with other countries.

- Major river systems within the Region cross the international, provincial and territorial boundaries, thereby giving rise to fourteen different bilateral situations where inter-jurisdictional conflict can arise. The potential for conflict is driven by proposed resource developments which use or consume large quantities of water. Wise management of a scarce resource is heavily dependent on data, information, advice, and counsel provided by the regional IWD. The key strategy is to make use of existing arrangements such as the Prairie Provinces Water Board and various international arrangements to anticipate and prevent problems from arising. In addition, new arrangements such as the Mackenzie Basin Board are under discussion. Regional IWD also attempts to influence other federal departments to carry out their programs in a manner consistent with the Federal Water Policy and a sustainable development ethic.

1.5 National/Regional Water/Wildlife Resources

- Three broad-scale habitat impact issues are important in the prairies; agricultural practices (in the grassland and parkland zones), forest exploitation and management (parkland and boreal forest), and integrated resource use. As knowledge of the impacts of these industries on migratory birds is fragmentary and complete, a focused effort to bring together and review existing knowledge of these impacts will be pursued, and emphasis will be directed to research to improve the database.

- An increasing public awareness of wildlife issues is reflected in an increased demand for Regional CWS to present a scientific view of predation issues to the public. Regional CWS will undertake studies of predator/prey relationships and publish the results.

- Regional CWS will continue to maintain expertise in other regional wildlife issues so that the best possible advice can be provided to client agencies in a broad range of fields of expertise.

- o Enhanced monitoring of wildlife populations (e.g. prairie and forest birds, buffalo in Wood Buffalo National Park) to anticipate and prevent population declines will be encouraged.

- o In cooperation with industry and other governments, a Cooperative Research Institute will be established a university in the Region.

- o Regional IWD will support Departmental initiatives relating to CEPA. NAWMP and water awareness. This support will be provided by adjusting programs, where feasible, and incorporating new resources when provided.

1.6 Natural Hazard Reduction

- o Reduction of the high economic risk to the agricultural community from waterfowl in close proximity to cereal grain crops is effected by operation of a crop damage prevention program delivered by provinces under federal/provincial cost-sharing agreements. Similar cooperative agreements with Agriculture Canada and the provinces provide some compensation for further impact on specific farmers on incurred losses. A five year agreement will be negotiated to effectively deliver crop damage prevention and compensation programs in coordination with Agriculture Canada and the provinces as part of the NAWMP and prairie soil and water conservation efforts.

Ontario Region

1.1 Migratory Birds

- o CWS will focus attention on the enforcement of the MBCA and CWS. There will be additional emphasis and focus in the Region on communication of survey results and enforcement activities through media releases and preparation of public information materials. As well, in response to changes with the RCMP, CWS will emphasize a coordinated enforcement and training program with Ontario detachments an subdivisions.

- o CWS will negotiate and implement a cooperative wildlife management agreement with Nishnawbe-Aski Nation which will address MBCA regulations and conflicts with native hunting for traditional and subsistence purposes. The agreement will provide a model for future conservation agreements.

- o CWS will study the impact of acidification on wildlife in wetland/headwater lake ecosystems and continue its biomonitoring surveys for assessing the long term impacts of acidification on aquatic birds.

1.2 Wildlife Habitat

- o CWS will undertake research and surveys of migratory birds and their habitats which will allow the impact of such human activities as forestry, agriculture and urban development on wildlife habitat and will contribute to the establishment of National Wildlife Areas, Migratory Bird Sanctuaries and Western Hemispheric Shorebird Network Reserves for their protection.

1.3 Endangered Species

- o CWS will undertake a review of its past successes regarding introduction programs (Bald Eagle/Peregrine Falcon), and will continue its cooperative re-introduction project for Osprey at two Great Lakes sites.

1.4 International Water and Wildlife Resources

- o Application of the Federal Water Policy (FWP) will be an important undertaking in the Region, as it delivers responsibilities respecting water quality and water quantity. Emphasis will again be placed on the Great Lakes basin, however, the Region will make a conscious effort to increase profile outside the basin as well.

- o The Region is involved to a significant extent in international Canada-U.S. activities. Major activities include the Great Lakes Water Quality Agreement (GLWQA), the IJC Reference on Fluctuating Great Lakes Levels and the IJC Air Reference in the Sarnia/Port Huron - Detroit/Windsor corridor.

- The Region is also involved internationally through its activities in support of the Western Hemispheric Shorebird Reserve Network which aims to protect migratory birds on their annual migration from the Canadian Arctic to southern South America.

- GLEO will continue to administer the 2.1 million dollar Great Lakes Water Quality Program fund. In addition, GLEO will develop the management framework for the Great Lakes Clean-up Fund. Efficient and effective management of the fund to meet the specific objectives of the Agreement/Protocol will be a priority.

- The Region and IWD will continue to work to meet Canada's commitments respecting the IJC Reference on Fluctuating Great Lakes Levels. Work on Phase II of the Reference will be continued in 1990-91. The Phase II report will be completed in 1992.

1.5 National/Regional Water and Wildlife Issues

- GLEO will lead renegotiation of the Canada-Ontario Agreement in order to include the requirements of the 1987 Protocol to the GLWQA.

- The Region and GLEO will work to link the GLWQA and Plan St. Laurent. This will be accomplished by seeking the participation of Quebec in the development of the St. Lawrence RAP, the Lake Management Plans and the development of GLWQA binational objectives.

- The Region will work towards the development of a Water Quality Agreement with Ontario.

1.6 Natural Hazard Reduction

- The Region, along with IWD and EPD, will continue to implement the regional infrastructure strategy.

Quebec Region

1.1 Migratory Birds

- o NAWMP: Quebec will receive $1 million for the Eastern Habitat Joint Venture and $600 thousand for the Black Duck Joint Venture.

- o Develop the joint plan for Arctic Geese Management to improve knowledge on geese populations in the Arctic for better management. The plan's related activities are still in the development stages.

1.2 Wildlife Habitat

- o The Black Duck Joint Venture will involve activities in three areas: inventories, tagging/marking and research. Emphasis will be placed on inventories in order to better understand population dynamics. On the research side, habitat characteristics will be the focus of attention, with the objective of developing a better overall understanding of the potential of Quebec territory via the use of satellite photography.

- o Negotiation and ratification of agreements with provincial partners to authorize acquisition of habitats by the Region and transfer these to specific managers.

- o Develop a new National Wildlife Reservation

- o In conjunction with the Quebec Wildlife Foundation acquire important habitat for wildlife.

1.3 Endangered Species

- o Establish in conjunction with the provincial government a prioritized list of species for protection.

1.4 International Water and Wildlife Resources

- o Develop a Documentation Centre and database on the St. Lawrence River that will be accessible to the public.

1.5 Regional/National Water and Wildlife Resources

- Develop a series of bio-indicators on the quality of regional ecosystems.

- Continue with the Great Whale Project in James Bay.

Atlantic Region

1.1 Migratory Birds

- The increasing pressure on migratory bird populations in Atlantic Canada and the rising public concern for the welfare of both game and non-game species will require that we continue to place priority on monitoring activities, sponsoring and undertaking research projects, entering into cooperative programs with wildlife interest groups/agencies, and publishing the results of the work in an effort to further educate the public on the need to protect and conserve migratory birds. The Region will continue to provide the national lead in the pursuit of amendments to the Migratory Birds Convention Act. Research and survey programs will be enhanced with the introduction of the Black Duck Joint Venture. The Region will focus its seabird research and monitoring on the advancement of the seabird colony register, the creation of sensitivity maps, research related to mortality factors and continue to lead in Eastern Arctic colony monitoring with the Western and Northern Region. New projects to be launched include: a study of the migration of seaducks along the coast of northeastern New Brunswick; surveys to clarify the fate of the once-abundant phalaropes in the Bay of Fundy; preparation of an eider management plan and inter-regional monitoring regime; and the regulation of the murre hunt.

- With financial support available from the Eastern Habitat Joint Venture, Black Duck Joint Venture, Wildlife Habitat Canada and Ducks Unlimited, the region can implement the regional component of NAWMP. A primary goal is the establishment of EHJV as a fully operation program in the coming fiscal year.

1.2 Wildlife Habitat

- It is important to preserve and enhance wetlands which provide crucial habitat for waterfowl and a wide variety of plant and animal species, and also to serve to moderate stream flow, recharge groundwater and improve water quality. The wetlands of Atlantic Canada have been steadily reduced in number in response to development pressure. Now that funds are available (EHJV) and with public support the Region has the opportunity to reverse the trend. They will pursue federal-provincial designation agreements to preserve and enhance wetlands for their intrinsic environmental values. In addition, the Region will establish a new wetlands research program.

1.3 Endangered Species

- RENEW and the establishment of the Endangered Species Recovery Fund provide vehicles for the protection and rehabilitation of endangered species. The Atlantic Region will implement regional recovery strategies in cooperation with the provinces, NGOs, and the public, which will include continued releases of the Peregrine Falcon in the Upper Bay of Fundy, a regional survey for breeding Peregrine Falcon nest sites, and implementation of the Piping Plover Recovery Plan with increased efforts on public information and coordination of regional activities. The Region also plans to lead in the development and implementation of a recovery plan for the protection and rehabilitation of the eastern race of the Harlequin Duck, which is expected to be classified as threatened or endangered.

1.4 International Water and Wildlife Resources

- The movement of migratory birds across international boundaries requires a liaison and cooperation with many other countries. The Regional Director CWS chairs the Western Hemispheric Shorebird Reserve Network, which provides an excellent opportunity to involve more countries in shorebird conservation. Joint programs are planned with Suriname under the Latin America Program, and the possible involvement of other countries will also be investigated. The Migratory Birds Convention Agreements will be pursued with St. Pierre de Miquelon, Greenland and Iceland to establish cooperative research and conservation programs. The Region will also pursue RAMSAR initiatives, specifically Groswater Bay.

- The Region will continue to be active participants in the International Joint Commission (IJC) Boards and will support conservation initiatives of the International St. Croix River Waterway Advisory Commission consistent with EC's interest under the Canadian Heritage River Program. In view of growing water-use conflicts and quantity/quality issues, we will continue to provide data and advice and to expand the technical tools to include environmental capacity models to measure compliance against stated water quality objectives. Tools to assess groundwater quality issues will be adapted from other jurisdictions and applied to the Saint John River Basin.

1.5 Regional/National Water and Wildlife Resources

- The water resources of Atlantic Canada encompass diverse and varied ecosystems ranging from simple headwater to complex estuarine systems, all subject to a variety of natural and anthropogenic stresses. It is critical that high quality water resource data be collected and interpreted in such a way that sound decision can be taken. The water quantity and quality networks must provide the cross-section of information that is required to support the spectrum of economic decisions, the varied ecosystems water supports and the State of the Environment reporting.

- The Region will continue to water quantity and quality data cooperatively with the provinces and major stakeholders. Considerable emphasis will be placed on developing technical tools, such as water quality objectives and environmental capacity modelling, within the framework of the Federal-Provincial Monitoring Agreements, to serve as a guide for future planning and compliance monitoring initiatives.

1.6 Natural Hazards

- In cooperation with the provinces, the Region will conduct science-based, issue-oriented water resources investigations through the Water-Economy Agreement framework, to ensure that water is brought to the forefront in the development of provincial conservation strategies and to provide interpreted information to decision-makers to ensure that water is an essential component of

environment/economy integration. The Region will continue Federal-Provincial Flood Reduction Programs by rolling existing mapping and study agreements into lower cost maintenance agreements as they expire. The Region will continue to influence federal and provincial government expenditures in floodplains to reduce disaster assistance payments.

Clients/Stakeholders/Partners

The regions are involved, to varying extents, with the main clients, partners, and stakeholders of the Inland Waters Directorate and the Canadian Wildlife Service. In addition to the national partners, several regions have extensive interaction with local agencies..

III EVALUATION ISSUES AND INDICATORS

2.1 Introduction

The evaluation issues for this study were determined using a systematic, four stage process. First, a preliminary list of evaluation issues was developed. The list was developed based on the following:

- o Office of the Comptroller General suggested Science and Technology evaluation issues;
- o Issues requiring coverage as per Cabinet directives on the review of Major Survey Programs and Central Agency requirements for the review of Regulatory programs; and
- o Input from Program personnel on important evaluation issues they would like information on.

Second, the issues were cast in question format and ranked by Steering Committee members in terms of high, medium or low priority. Third, the issues which ranked consistently high in priority across Committee members were summarized and selected for inclusion in the study design.

2.2 Evaluation Issues and Indicators

During our consultations interest in evaluation issues tended to coalesce around two major themes. First, program managers were interested in issues that dealt with the overall structure or organization of the programs. Concerns were raised about the extent to which the programs of Natural Resource Conservation will be able to respond to increased demands resulting from increased public expectations. This theme emerged through discussions with program personnel who expressed concerns about the changing nature and scope of their work.

The second issue group that program managers and Steering Committee members were interested in dealt with the effects of the programs. Of particular interest, were the opinions of the client, stakeholders and partners with whom they collaborate.

In order to facilitate the issue development process, the OCG Science and Technology (S&T) issue categorization framework was utilized. High priority issues within each of these categories, as indicated by Steering Committee member ranking of issues, are listed below. Separate issue categories were created for T.B. and Cabinet Regulatory Program and Major Survey Program issue requirements.

Suggested indicators for responding to the issues are included as well. Indicator information was obtained through discussion with program personnel.

Finally, the development of evaluation issues to include in the study is not a linear process; i.e., an issue is developed then information is obtained to address it. Rather, in most cases information relevant to the evaluation issue already exists. In certain instances sufficient information already exists to address the evaluation issue at the assessment stage. Consequently, at the end of our discussion of each evaluation issue we have included a Recommendation section which briefly describes the information obtained to date in the study, and recommends whether or not the issue needs to be investigated further in the evaluation.

The following are the major issue categories for consideration in the evaluation:

1.0 Rationale: The rationale of Natural Resource Conservation programs in terms of the legitimacy, relevance and structure of the programs given the federal government's priorities and goals with respect to natural resource conservation,

2.0 Client Relevance: The relevance of Natural Resource Conservation programs to the various clients, stakeholders, and partners that they interact with in the delivery of their programs.

3.0 Program Management: The overall management of the program to include and examination of design and delivery aspects of the program.

4.0 Outcome Issues: The results of Natural Resource Conservation programs in terms of their achieving objectives, and the resulting impacts and effect of their activities.

5.0 Required (Regulatory) Issues: An examination of the regulatory aspects of the programs in terms of if there are alternative delivery strategies or mechanisms to achieve program objectives.

6.0 Required (Major Survey) Issues: An examination of the survey components of Natural Resource Conservation (Water Management Data and Lands Directorate) requiring review as per the Cabinet Directive on reviewing major survey programs.

The evaluation issues and questions within each of these categories, along with appropriate indicators are described below. Recommendations as to the inclusion of each issue in the subsequent study are included as well.

1.0 RATIONALE

The rationale of a program is examined in order to determine the extent to which it relates to and links with overall federal government priorities and policies. To fully assess the rationale of programs indicators should address the following three components.

1.1 Legitimacy

1.1.1 Do the Natural Resource Conservation activities undertaken by the Canadian Wildlife Services and the Inland Waters Directorate constitute a legitimate role for the government at this time?

The indicators suggested here are intended to provide for an examination of the extent to which the current Natural Resource Conservation programs are seen as legitimate. It is generally accepted that government must, in the national interest, perform certain tasks that must be done, but which no other organization can or is willing to do. Analysis should focus on the appropriate boundaries for government action; that is, is Natural Resource Conservation undertaking activities in the appropriate areas the will contribute to the conservation of Canada's natural resources? Useful indicators include:

- analysis of the rationale or justification for federal government involvement in natural resource conservation;

- o the opinions of departmental management and central agency analysts as to the appropriate level of government involvement and programming instruments to be utilized; and
- o the opinions of the various clients, stakeholders, and partners of the programs, as to the appropriate role for the federal government.

Recommendation:

Given the current public concern with all aspects of the environment, the federal government, as well as all other levels of government, have a key role to play in ensuring environmental conservation and protection. Recent public opinion polls indicate that the majority of the Canadian public view the environment as one of the key, if not the key issue they are concerned about. There appears to be little doubt as to the legitimacy of federal government involvement in the environment in general, and natural resource conservation in particular.

In addition, Conservation and Protection have undergone an extensive review and analysis of the rationale of the conservation and protection activities of the department. This process began with each directorate undertaking detailed results definition studies. These were than subsequently reviewed, revised and integrated into the overall C&P Results Model. Finally, a process for defining "results measurement" was completed.

Therefore, we believe that no further study is needed on this issue and recommend that it not be included in the evaluation study.

1.2 Relevance

1.2.1 Do the conditions which gave rise to the establishment of C&P's natural resource conservation activities still prevail today? To what extent have they changed?

The issue is concerned with determining the extent to which the mandate and objectives of the programs have changed over time. The emphasis is on determining the Natural Resource Conservation response to its evolving environment, and whether the existing programs are still appropriate given a changing environment and expectations. Appropriate indicators include the following:

- o comparative analysis of the original mandate, objectives and goals with the current mandate, objectives and goals;
- o departmental management opinions as to the changing environment and expectations of Natural Resource Conservation, and the extent to which it responded to the change; and
- o client/stakeholder/partner opinions as to the changing role of the natural resource conservation activities of IWD and CWS and how well they have adapted.

Recommendation:

There is no question that the natural resource conservation activities of CWS and IWD have changed markedly since the creation of the organizations. The changes in environmental problems in terms of their scope and breadth, has been enormous in the last decade alone. Indeed, the consolidation of the Environmental Protection and Environmental Conservation services into C&P can be seen as a direct response to the need for a more flexible structure with which to address changing environmental conditions and problems. Also, as noted above, the exhaustive C&P Results Model development process documented the reasons and rationale for changes within the conservation and protection activities of the Department. The issue at hand is whether evaluation resources should be devoted to charting the change in the natural resource conservation activities of C&P. At the moment there does not appear to be sufficient reason to justify undertaking such an historical analysis, particularly since much of the information currently exists in existing C&P documentation. Therefore, we recommend that the issue not be included in the evaluation study.

1.2.2 Are the objectives of C&P's natural resource conservation programs consistent with the government's current policies, priorities and goals?

Government policies and priorities change over time, and it may be that government programs have not changed with them, or that the emphasis of the programs are not consistent with current policy priorities. The following indicators would provide useful information as to the linkage between Natural Resource Conservation and the federal government priorities:

- o an analysis and linkage of Natural Resource Conservation activities with federal government natural resource conservation responsibilities, policies and priorities contained in documents such as:

- the Speech from the Throne
- the Federal Water Policy
- the Canadian Environmental Protection Act
- the Canada Water Act
- the Boundary Waters Treaty Act
- the International River Improvement Act
- the Migratory Birds Convention Act
- the Canada Wildlife Act
- the Game Export Act

o departmental management opinions as to the linkages with overall government policy; and

o client/stakeholder/partner opinions as to the linkages between the CWS and IWD policies and programs and other federal government policies, priorities and programs.

Recommendation:

The federal government is currently working on a major new thrust with respect to the environment. The Environmental Agenda Action Plan will establish the federal government's policies, priorities and goals related to the environment into the new millennium. Environment Canada is the lead department in developing the Agenda and through Natural Resource Conservation of C&P, in implementing the federal government initiatives in natural resource conservation. Until such time as the details of the Environmental Agenda are known, it would not be prudent to proceed with a comparative analysis of the links between C&P policies and objectives, and overall federal policies and priorities. Therefore, we believe an analysis of the linkage between C&P and federal policies and priorities, important as it is, should be deferred, and recommend that it not be included in this evaluation study.

1.2.3 What impact will CEPA and the development of the federal government Action Plan for the Environment have on the natural resource conservation activities of CWS and IWD?

The full implementation of the Canadian Environmental Protection Act (CEPA) will likely create additional workloads for both the IWD and CWS. This in turn may create

the need for a restructuring of natural resource conservation and/or the Conservation and Protection Program. Similarly, the release of the Action Plan for the Environment may result in significant changes in the structure and focus of Natural Resource Conservation programs. Key indicators of these impacts include:

- o departmental management opinions of the impact of CEPA and the Environmental Agenda on the IWD and CWS workload and program structure; and
- o client/stakeholder/partner opinions of their impact on IWD and CWS activities. Of particular interest will be provincial partners' assessments of the need for, and ability of, IWD and CWS to undertake an increased role.

Recommendation:

There is little doubt that the full implementation of CEPA, and the details of the Action Plan for the Environment will impact on the activities of the C&P's Natural Resource Conservation component. The question is will the effects of these initiatives be sufficiently realized at the time of the evaluation. Currently, EC is working on an action plan for implementing CEPA and signing Equivalency Agreements with the provinces. As noted previously, the Action Plan for the Environment is due for release in the Spring of 1990. Obviously, the full impacts and effects of these initiatives on the activities of Natural Resource Conservation will not be realized at the time the evaluation is being conducted. Therefore, we recommend that this issue not be addressed specifically in this evaluation. However, given the importance of these initiatives they will likely arise and be commented on with respect to other issues included the evaluation.

1.3 Structure

1.3.1 Is the current breakdown between possible programming instruments, such as:

- the collection and analysis of scientifically reliable and valid data on the state of Canada's water and wildlife resources;
- the communication of this information to interested clients/stakeholders/partners in a readily understandable form;
- the influence and/or leadership provided by Natural Resource Conservation, through instruments such as, economic incentives, user fees, public ownership, etc ; and

- the use of regulations and enforcing their compliance to achieve desired effects;

appropriate given current Natural Resource Conservation objectives? If not, where is more/less emphasis required?

Recommendation:

The inclusion of this issue would indicate a need to examine the programs in terms of the selection of programming instruments and the level of effort devoted to each. The questions to be answered with respect to this issue are similar to those for Issue 3.0 Program Management. This program structure issue can be combined with issue 3.1 dealing with the distribution of resources from a program management perspective. Therefore we recommend that it not be included in the evaluation as a separate issue.

2.0 CLIENT RELEVANCE ISSUES

2.1 To what extent are the various clients/stakeholders/partners satisfied that Natural Resource Conservation programs and activities are producing, or likely to produce results which will be useful to them? To what extent are the programs responsive to client/stakeholder/partner needs?

The key indicator for this issue is the satisfaction of the clients, stakeholders and partners with the programs and activities in terms of overall results, and their responsiveness to individual needs. Some groups may be reticent to criticize the programs for fear that this could result in reductions to, or discontinuation of the programs. However, a clearly written and concise questionnaire should reveal whether or not the program's outputs and results are effective, and if so why and how. Indicators include:

- o client/stakeholder/partner opinions on the usefulness of the programs; and
- o program management self-assessments of the usefulness of their programs to their clientele.

Recommendation:

As indicated in the C&P Results Model, C&P's activities with respect to natural resource conservation can only contribute to the conservation of Canada's natural resources. They require the cooperation, to varying degrees, of a number of clients/partners/stakeholders. Their belief in and willingness to cooperate with C&P's conservation efforts are crucial to the success of natural resource conservation efforts. Consequently, a survey of their opinions and satisfaction with C&P's efforts is required in order to undertake a useful evaluation. Therefore, we recommend that this issue be included in the evaluation study.

2.2 Are there opportunities to increase the level of cooperation on research and policy matters with clients/stakeholders/partners, such as, other federal departments, provinces/territories, universities and private industry?

Sub-issues include the following:

To what extent do the programs duplicate, complement or work at cross-purposes with other programs (federal and provincial)? Are there opportunities to improve the joint delivery of programs?

Can/should Natural Resource Conservation take a leading role in establishing "integrated planning" (cooperative decision-making between various levels of government and the private sector)? If yes how can it assume this role? If no, why not?

The indicators here should provide an assessment of the potential for increased collaborative and cooperative efforts between the actors involved in natural resource conservation. Specific indicators include:

- o analysis of the current levels of cooperation;
- o client/stakeholder/partner opinions of the potential for increased cooperation. Questions should not focus solely on the potential for increased cooperation between just two organization, i.e. a province and the federal government, but also, examine the potential for creating multi-partner undertakings, involving a mix of private and public sector actors; and
- o program management perceptions as to the potential for increased cooperation and collaboration.

Recommendation:

Preliminary indications are that both IWD and CWS have forged excellent cooperative arrangements with the other major players involved in natural resource conservation, such as the provinces/territories, international agencies and NGOs. However, since the successful achievement of long-term environmental effects requires the cooperation of an array of actors, information on ways to improve this cooperation will be extremely useful to program managers. In addition, since a survey of clients/stakeholders/partners is already recommended for the evaluation, the inclusion of this issue does not represent a significant increase in evaluation effort. Therefore, we recommend it be included in the evaluation study.

3.0 PROGRAM MANAGEMENT ISSUES

Program management issues seek to determine if programs are managed in such a way that it is reasonable to expect that anticipated benefits will accrue from the programs, and that these will lead to the intended program results. The following are specific issues which address this general issue area.

3.1 Is the level and distribution of resources within the following programming instruments:

- the collection and analysis of scientifically reliable and valid data on the state of Canada's water and wildlife resources;
- the communication of this information to interested clients/stakeholders/partners in a readily understandable form;
- the influence and/or leadership provided by Natural Resource Conservation (including an analysis of alternative program instruments such as, economic incentives, user fees, public ownership, etc.); and
- the use of regulations and enforcing their compliance to achieve desired effects.

appropriate given current Natural Resource Conservation objectives? If not, where is more/less emphasis required?

The issue here deals not only with the appropriateness of the current level of resources of Natural Resource Conservation programs, but also, more importantly, the level and distribution of resources, given that the nature and types of issues that have to be dealt with are rapidly changing. Individual concerns of the IWD and CWS can be addressed within this issue category. For example, a key IWD resourcing concern has to do with the adequacy of the existing water data collection system for present and future needs.

Important sub-issues include:

o Are the size, structure and organization of the programs suitable in relation to the number of "critical" issues the department has to deal with and the frequency with which they emerge? How does this impact on the longer-term "wise management" aspects of their responsibilities?

- Is the program cost-effective? How could cost-effectiveness be improved?

The inclusion of this issue indicates a need to examine the programs in terms of the selection of programming instruments and the level of effort devoted to each. As reflected in the C&P Results Model, Natural Resource Conservation, as do the other two sub-activities, employ four strategies or approaches in order to achieve the desired environmental effects. The strategies can be viewed as a continuum building on each other to achieve the desired effects. First, there is a requirement is to collect reliable and valid scientific data on the state of the environment. Second, this information then has to be properly communicated to all interested clients/stakeholders/partners. The communication has to take place in such a manner that C&P provides leadership and influences clients/stakeholders/partners to undertake activities which will contribute to the conservation of Canada's natural resources. Finally, if the previous three strategies are properly employed then Canadians should comply with legislation designed to conserve the environment. There remains however a requirement to enforce specific legislation to ensure compliance. All of these strategies have to be effectively delivered if the overall environmental effects are to be achieved.

Specific questions will deal with the adequacy of the existing program structure to effectively apply each of the strategies. Evaluation indicators include:

- analysis and review of the programming instruments selected and the resources currently devoted to each;
- departmental management opinions as to the appropriate type of programming instruments to use in order to achieve program objective; and
- client/stakeholder/partner opinions as to the most effective mix of programming instruments to achieve program objectives.

Recommendation:

Preliminary indications are that both IWD and CWS have strong abilities in the collection, and analysis of scientific data on the state of Canada's water and wildlife resources. The key questions concern the ability of the organizations to effectively communicate this information and provide the required influence and leadership in order to achieve long-term environmental effects. Given the relatively short history of the C&P Results Model, the evaluation should focus on the ability of the IWD and CWS to effectively deliver each of the four strategies. We recommend that this issue be included in the evaluation study.

3.2 Do the programs have the appropriate balance between national and regional priorities?

Both Headquarters and Regional staff commented that the re-introduction of the Regional Director-General structure had affected the way in which the groups undertake their activities. Preliminary discussions were not conclusive as to whether the appropriate balance between national and regional priorities had been achieved. Consequently, we suggest that further investigations of this issue occur. The key indicators are:

- o departmental management opinions from both headquarters and the regions on the effectiveness of the matrix management system in providing the appropriate balance between national and regional priorities; and
- o client/stakeholder/partner opinions as to the impacts and effects, if any of the re-introduction of the Regional DG structure.

Recommendation:

Long-term Operational Planning based on the C&P Results Model and the C&P National Regional matrix management system have been occurring for the past few fiscal years. The evaluation provides an excellent opportunity to comment on those aspects of the system that are functioning effectively and identify opportunities for improvement. Since the effective functioning of the matrix management system is key to the achievement of the desired long-term environmental effects, we recommend that this issue be included in the evaluation study.

4.0 OUTCOME ISSUES

4.1 Objectives Achievement

4.1.1 Are Natural Resource Conservation programs and activities meeting their objectives? Have they met goals in terms of cost, timeliness and results anticipated? Can objectives achievement be measured at the program level?

The first step in addressing this issue will be to clearly establish the linkage between the individual components of the IWD and CWS responsible for contributing to the six long-term environmental effects of Natural Resource Conservation. The next step will be to identify the extent to which the individual groups or components contribute to the achievement of the effects. With respect to Outcome Issues the "Results Measurement Project Report" provides important information on the anticipated effects and results of the C&P activity. The report identifies 32 result measures that are in a state which would allow immediate implementation; of these 26 are labelled as being of key significance. The report suggests implementing the results measure for these 26 by the beginning of the new fiscal year, thus, the evaluation will likely be occurring during this implementation phase. Therefore, the use of these indicators for the current evaluation will be limited by the extent to which the indicator information is available in a readily usable format. However, there exists a wealth of information on the impacts and effects of conservation activities in the State of the Environment reports and their supporting documentation.

Suggested indicators for this issue include:

- an analysis and comparison of Natural Resource Conservation activities and outputs with objectives and desired effects as outlined in long-term plans and the C&P Results Measurement Project;
- departmental management self-assessments of the extent to which they have achieved program objectives, and the factors contributing to the achievement, or lack thereof; and
- client/stakeholder/partner opinions of the extent to which the IWD and CWS have contributed to the achievement of natural resource conservation objectives. The clients/stakeholders/partners selected for inclusion in the sample will have to be sufficiently familiar with the IWD and CWS programs and their objectives, so that they can provide useful comments.

Recommendation:

A key factor in the success of any program strategy is the achievement of the various individual objectives and their relation to overall objectives or goals. In terms of Natural Resource Conservation this requires an assessment of each programs's contribution to the overall natural resource conservation goal. Therefore, we recommend the inclusion of this issue in the evaluation study.

4.2 Impacts and Effects

4.2.1 What have been and/or are expected to be the broad impacts and effects (both positive and negative) of Natural Resource Conservation programs?

The Results Measurement Project report will again be particularly useful for addressing this issue. In the report, the expected effects of the C&P programs have been described and the measure of each outlined. As above, the extent to which these measures can be utilized depends on how operational they are at the time of the evaluation. SOE reports should provide the majority of information relating to the impacts and effects of the programs. This can be supplemented by program management and client/stakeholder/partner opinions as to the actual effects (intended outcomes) of the program and what the impacts (unintended outcomes) are. Thus, the indicators for this issue are:

- a comparison of the intended program effects to observed impacts and effects as per the results measurement framework;
- program management opinions as to the impacts and effects of their programs; and
- client/stakeholder/partner opinions as to the impacts and effects of the IWD and CWS activities on natural resource conservation.

Recommendation:

The C&P Results Model is an "effects" based model. It is essential for natural research conservation, that the appropriate effects are realized at each level in the model. Therefore an analysis of both impacts and effects is crucial to an evaluation of Natural Resource Conservation. Therefore, we recommend that this issue be included in the evaluation study.

5.0 REQUIRED (REGULATORY) ISSUES

5.1 Is regulation still the best way for Natural Resource Conservation to achieve certain of its program objectives? Are there any reasonable alternatives to regulation?

Environment Canada is committed in its Evaluation Plan to evaluate two "regulatory" programs within Natural Resource Conservation: Migratory Birds Conservation and Wildlife Conservation. Indicators must first document the extent that Natural Resource Conservation programs use regulation to achieve their program objectives. The next step is to determine how effectively they are able to enforce the regulations. The final aspect will be identifying any alternative program instruments that would more effectively achieve program objectives. Indicators include:

- documentation of the existing regulatory regime;
- analysis of program statistics, such as number of violations, convictions etc. to determine the effectiveness of enforcement;
- program management opinions as to the effectiveness of regulation and enforcement, and suggestion for alternative strategies where appropriate; and
- and client/stakeholder/partner opinions as to the effectiveness of regulation and enforcement, and alternatives.

Recommendation:

The commitment to evaluate the regulatory components of Natural Resource Conservation in the Evaluation Plan necessitates the inclusion of this issue in the evaluation. We do note, however, that regulation is only a small portion of the activities of Natural Resource Conservation.

6.0 REQUIRED (MAJOR SURVEY) ISSUES

Following the release of the findings of The Task Force on Program Review (Nielsen Task Force), Cabinet issued a directive that all major survey programs be reviewed. This review was scheduled to be conducted in conjunction with the evaluation process. Two major survey programs related to Natural Resource Conservation were identified as requiring review these were: the Water Management Data surveys of IWD and the Canada Land Use Monitoring Program (CLUMP) of the Lands Directorate. Since, the Lands Directorate no longer exists as a separate organization we will discuss what happened to its survey programs first and then move on to a discussion of the survey components of IWD.

The Cabinet Directive instructed EC to find ways and means to reduce the size and scope of the Lands Directorate by discontinuing its participation in the three EC integrated programs covering:

- Toxic Chemicals;
- Long-Range Transportation of Air Pollutants; and
- Environmental Assessment and Baseline studies.

In addition, it instructed EC to discontinue its Canada Land Use Monitoring Program (CLUMP).

With the disbanding of the Lands Directorate it effectively discontinued its participation in the three programs. The Canada Land Use Monitoring Program (CLUMP) represented the major survey program of the Lands Directorate. The program was designed to provide an assessment of the use of Canada's land both in terms of actual and potential use. It was designed as a four or five year program which was implemented through the regional offices, with support for data processing and functional guidance from HQ. The program was discontinued when the Lands Directorate was disbanded. The products from the program were a series of "Fact Sheets" on Canada's land use and a database. When the program was disbanded the group responsible for CLUMP were amalgamated into the SOE Reporting group. They now have the database and the fact sheets. However, there are no plans to undertake any further monitoring or surveying related to CLUMP. Therefore, there is no requirement to do any follow up on CLUMP, since it no longer exists as a major survey program. The focus, then, of the major survey component of this evaluation should be on the water management data collection activities of IWD.

The review of the water management survey activities of IWD should occur through the examination of the following five issues.

6.1 Are there alternatives to the federal provision of water management survey?

6.2 Are there opportunities for increased commercialization of the water management survey by further:

- o contracting out;
- o make-or-buy;
- o cost recovery;
- o privatization; and/or
- o joint management of activities?

6.3 Are there opportunities for productivity improvements through technological change or revisions to the level of service?

6.4 Are there opportunities to promote the economic and/or technical potential of the water management survey?

6.5 Do the existing pricing policies conform with Treasury Board Directives on cost recovery, publishing, and access to information?

Indicators to address these issues should include:

- o client/stakeholder/partner opinions on each of the issues;
- o departmental management opinions on each of the issues: and
- o detailed reviews of previous studies on these issues.

Recommendation:

There is a Cabinet directive requiring the examination of these issues, therefore, they must be included in the evaluation study. However, there have been studies of alternatives methods for the collection of water management data, which will greatly assist in the evaluation exercise. The 1985 "Review of Current and Alternative Organizations for Collection and Delivery of Water Quantity Data" by Walker and Partners, and Acres

International touch on most of these issues. It reported that "Our basic recommendation is that the collection and delivery of water quantity data remain under the current arrangements within the Department of Environment". This information will be extremely valuable for the current evaluation, and in some cases may only require that existing information be updated.

IV EVALUATION DESIGN

4.1 Introduction

The evaluation design provides the strategy to link the indicators with the related evaluation issues. That is, to be meaningful, the indicators or measures must be taken in such a way that they clearly provide evidence that allows effects to be attributed to the program. Essentially, the evaluation design or strategy sets out the approaches for producing evidence of program effects. Approaches, then, set out the methods and sources that can be employed to utilize the indicators discussed in the previous section.

4.2 Approaches

The approaches discussed in this section have been selected with reference to the sources and methods available for providing the appropriate indicator information with which to address the evaluation issues. Utilizing a single indicator may involve employing more than one approach if, for example, supporting evidence is available from both written sources, i.e. literature or program statistics, and interviews.

4.2.1 Review of Literature

On the subject of the environment and natural resource conservation, there exists a wealth of literature that can provide background information on both current environmental problems and strategies designed to deal with them. Of particular importance will be State of the Environment reports and supporting documentation. Another interest may be studies which examine methods for achieving environmental goals through the use of various economic incentive programs. Also of interest would be literature describing the experiences of other countries in dealing with natural resource conservation, which could provide a "lessons learned" aspect to the evaluation. This literature can be readily identified through a computerized search of the Environment Canada library and the Canadian Institute for Science and Technology Information (CISTI) as well as by asking program people to recommend appropriate literature.

4.2.2 Review of Program Documentation

It is important that background documentation related to program development as well as program management be reviewed. These provide the context in which the programs evolved and, therefore, should contribute to most aspects of the evaluation study as reference materials.

In the course of researching this evaluation assessment, the following documents were key references:

General Documents

- Environment Canada 1989-90 Main Estimates
- C&P Results Model/Operational Planning Framework Project Report
- C&P Results Measurement Project Report
- Brundtland Report
- Environment and Development: A Canadian Perspective
- Report of the National Task Force on Environment and Economy

Canadian Wildlife Service

- Long Term Operational Plans 1990-1994
- CWS Annual Reviews
- Man and Wildlife in a Shared Environment
- CWS - Results Definition Study
- Review of Enforcement Activities for CWS

Inland Waters Directorate

- Long Term Operational Plans 1990-94
- Currents of Change: Final Report of the Inquiry on Federal Water Policy
- Federal Water Policy
- The Canada Water Act Annual Reports
- Evaluation of the Canada Water Act and Funding
- Evaluation of the Water Resource Research Support Program with Recommendations for the Decade Ahead
- The Boundary Water Issues Compendium

- The Adequacy of Hydrometric Networks in Canada to Meet Future Needs
- Water Quantity Surveys: Federal-Provincial Cost-Sharing Agreements
- Review of Current and Alternate Organizations for Data Collection and Delivery of Water Quantity Data

4.2.3 Surveys of Clients/Stakeholders/Partners

While conducting the assessment phase for this evaluation, it became clear that program managers believe one of the best methods for evaluating their programs is to talk to the clients of their work, the partners with whom they jointly deliver aspects of the programs, and other groups that, although they do not have regular contact with the programs, have a significant interest in the activities and effects of the Natural Resource Conservation programs. The belief is that these groups have the appropriate level of understanding of the complex environmental issues, and are sufficiently aware of the nature of the programs to provide useful assessments of the Natural Resource Conservation programs and activities. The decision to treat clients/stakeholders/partners as one category is a reflection of the difficulty the programs have in distinguishing between the three. For example, provincial personnel who assist in the collection of water quantity data, and thus can be considered partners, may also access and use other water management data, and in this sense are clients.

Evaluations often survey independent experts on their assessments of particular programs, and we are including experts by surveying stakeholders. Experts and stakeholders can help to focus, interpret and describe issues in addition to contributing their own evaluative information on the program's rationale and impacts. Consultations can take place on an individual basis or through panels or focus groups.

In summary, then the evaluation should survey a sample of representatives from provincial and municipal environmental organizations, non-government organizations (NGOs), university professors in environmental science programs, and representatives from international organizations.

Survey instruments address issues for which reliable information is not available. The Results Measurement working group has recently undertaken a detailed exercise in defining desired program effects and appropriate measures for achieving these result. A key finding of the exercise was that program managers were wary of having their programs evaluated solely on the basis of objective indicators, such a trends in bird

populations, since their are a number of factors that can affect bird population. The fear is based on the difficulty of objectively attributing the effects or results of a particular activity, to the component elements which combined to produce the result. As a result program managers indicated to us that one of the best methods for addressing the proposed evaluation issues was to survey their partners, clients and stakeholders.

Depending on the number of individuals to survey, and the scope and length of the survey, mail back questionnaires, phone and personal interviews can be used individually, or in some combination. These methods are explained below:

- Mail-back questionnaires are good for the collection of objective facts and information which respondents have to look up in files, such as the details of a project. Mail-back questionnaires are also useful for very large surveys where some broadly based information items are required. Unfortunately, mail-back questionnaires tend to take a long time to implement; they exhibit low response rates; they do not deal well with abstract concepts such as rationale and alternatives; and it can be difficult to control who responds. Also, scientists and environmentalists may find responding to written questions more onerous than responding to questions asked on the phone or face-to-face. To offset a low response rate, follow-up telephone interviews could be employed in cases where questionnaire recipients have not responded.

- Phone interviews are useful for collecting information in a relatively short time-frame, exhibit much higher response rates than mail-back surveys, and are often more appropriate for answering descriptive questions than mail-back questionnaires due to the interviewer's ability to clarify questions and probe. They also lower respondent resistance to expanding on points when he/she does not have to write them down. When a telephone interview is combined with a preliminary mail-out questionnaire, a relatively abstract level of discussion can take place, and attitudinal or perceptual questions can be asked in addition to factual or descriptive questions. Good phone interviewing requires some skill, and the length of interviews should not generally exceed 30 minutes. Unlike consumer phone interviews, the interviewer of clients, partners and stakeholders of federal programs should be familiar with the respondent and their interaction with the program before the call.

- Personal interviewing allows the interviewer to fully probe questions, and to enter into abstract and complex discussions which may become necessary during investigations of topics such as the rationale for government action on the environment, particular aspects of program management, or the most appropriate programming instrument to use in order to achieve program objectives. In order to keep the interview process as efficient as possible, factual information questions should be provided in advance. As in the phone interview, the interviewer must take advantage of their prior respondent selection by learning everything they can about the respondent before the interview appointment. An interviewer should establish a rapport with the respondent and conduct the interview as a conversation, using an interview guide as a checklist to be answered in the order necessary. The difficulty with personal interviews for evaluation purposes is that they can be time consuming and require a considerable amount of expertise and consistency in order to be done properly.

4.2.4 Surveys of Program Management

As well as serving as an information source on Natural Resource Conservation programs, interviews with program management provide an opportunity to document the perceptions of those administering the program and to compare these with the perceptions of those to whom it is targeted. These interviews allow some assessment of the variability of opinions between directorates and between headquarters and the regions with respect to a variety of issues. In addition, interviews provide an opportunity to exploit the knowledge of those involved regarding program alternatives.

Interview subjects should be chosen in order to obtain a sample representative of officials involved at all levels and in all regions.

4.2.5 Program Statistics

The Results Measurement Project Report identifies 26 key measures of the C&P Activities program effects which "could be implemented immediately with little or no additional costs..". Examples of these include trends in levels of water quantity and quality, and wildlife populations, many of which are available from current Departmental

databases. These will be used to address evaluation issues, where appropriate. It is anticipated that the most frequent usage will be for objectives achievement, and impacts and effects issues. In addition, information on program effects will be available from SOE reports and their supporting documentation and databases.

4.2.6 Analysis of Policy

Policy analysis involves the use of a variety of sources to describe and synthesize relevant policies around selected evaluation issues. Policies that are relevant to natural resource conservation can stem from central agencies, the corporate level, and the program management level, depending on their scope. Each policy has an underlying rationale, which is the outcome of a process of decision-making in any of a variety of forums, from task forces to committees at cabinet, legislative, corporate and program levels. The outcome of a policy analysis is a description and assessment of the policy environment in which the program operates and from which its objectives are derived. As objectives serve as the touchstone for the evaluation of program performance, policy analysis can be important as a foundation for the evaluation study.

4.3 Linkage of Issues, Indicators and Approaches

The final step in evaluation design is to link evaluation issues and indicators with the appropriate approaches or methods. This involves determining which methodological approaches will provide the appropriate indicator information which will allow the issue to be appropriately addressed. On the following pages we have developed issue, indicator and approach matrices for each of the evaluation issue categories. The indicators for each evaluation issue are related to all applicable approaches with and "H", "M", or L" which signifies high, medium or low reliability respectively. The level of reliability of the approach is based upon estimates of objectivity, the amount of information to be gained, and the type of information to be gained.

EXHIBIT 5

ISSUE CATEGORY	APPROACHES					
1.0 Rationale	Reviews		Surveys/Consultations		Analysis	
Issues & Indicators	Literature Review	Document Review	Client/Stakeholder/ Partner	Program Management	Program Statistics	Policy
1.1 Legitimacy						
1.1.1 Legitimate role for IWD & CWS?						
• analysis of the justification for governmental action	L	H				H
• program mgmt. opinions				M		
• client/stakeholder/ partner opinions			M			

EXHIBIT 6

ISSUE CATEGORY	APPROACHES					
1.0 Rationale	Reviews		Surveys/Consultations		Analysis	
Issues & Indicators	Literature Review	Document Review	Client/ Stakeholder/ Partner	Program Management	Program Statistics	Policy
1.2 Relevance						
1.2.1 Have original conditions changed and to what extent?						
• comparison of original objectives with current objectives		H		H		H
• program mgmt. opinions						
• client/stakeholder/ partner opinions			M			
1.2.2 Objectives consistent with government priorities?						
• analysis of linkage with gov. policies & priorities		H				H
• program mgmt opinions			H			
• client/stakeholder/ partner opinions		M				

EXHIBIT 7

ISSUE CATEGORY	APPROACHES					
1.0 Rationale	Reviews		Surveys/Consultations		Analysis	
Issues & Indicators	Literature Review	Document Review	Client/Stakeholder/ Partner	Program Management	Program Statistics	Policy
1.2 Relevance (Cont'd)						
1.2.3 Impact of CEPA / Action Plan?						
• program mgmt. opinions				H		H
• client/stakeholder/ partner opinions			M			
• roles & responsibilities review		M				

EXHIBIT 8

ISSUE CATEGORY	APPROACHES					
1.0 Rationale	Reviews		Surveys/Consultations		Analysis	
Issues & Indicators	Literature Review	Document Review	Client/Stakeholder/ Partner	Program Management	Program Statistics	Policy
1.3 Structure						
1.3.1 Breakdown between program instruments?						
• analysis & review of existing program instruments		H				M
• program mgmt. opinions		H		H		
• client/stakeholder/ partner opinions			M			

EXHIBIT 9

ISSUE CATEGORY	APPROACHES					
2.0 Client Relevance	Reviews		Surveys/Consultations		Analysis	
Issues & Indicators	Literature Review	Document Review	Client/Stakeholder/ Partner	Program Management	Program Statistics	Policy
2.1 Satisfaction with program results?						
• client/stakeholder/ partner opinions	L	M	H			
• program mgmt opinions		M		M		
2.2 Increased opportunities for cooperation?						
• current levels of cooperation					H	H
• client/stakeholder/ partner opinions	L	M	H			M
• program mgmt opinions		M		H		

EXHIBIT 10

ISSUE CATEGORY	APPROACHES					
3.0 Program Management	Reviews		Surveys/Consultations		Analysis	
Issues & Indicators	Literature Review	Document Review	Client/Stakeholder/ Partner	Program Management	Program Statistics	Policy
3.1 Level & Distribution of Resources						
• analysis of the level & type of resources		H		H	H	
• comparison of activities & outputs to original workplans		H		H	H	H
• program mgmt opinions		H		H		
• client/stakeholder/ partner opinions	L		H			
3.2 Balance between national and regional priorities?						
• program mgmt opinions		H		H	M	M
• client/stakeholder/ partner opinions	M	M	H			

EXHIBIT 11

ISSUE CATEGORY	APPROACHES					
4.0 Outcome Issues	Reviews		Surveys/Consultations		Analysis	
Issues & Indicators	Literature Review	Document Review	Client/Stakeholder/ Partner	Program Management	Program Statistics	Policy
4.1 Objectives Achievement						
4.1.1 Objectives met?						
• comparison of outputs & activities to long-term plans					M	M
• program mgmt opinions		H		H		
• client/stakeholder/ partner opinions	L		H			
4.2 Impacts & Effects						
4.2.1 What are impacts & effects?						
• compare results model effects to observed impacts & effects		H			M/H	
• client/stakeholder/ partner opinion			H			
• program mgmt opinions				H		

EXHIBIT 12

ISSUE CATEGORY	APPROACHES					
5.0 Required (Regulatory)	Reviews		Surveys/Consultations		Analysis	
Issues & Indicators	Literature Review	Document Review	Client/Stakeholder/ Partner	Program Management	Program Statistics	Policy
5.1 Regulation vs. alternatives?						
• review of regulatory elements of programs		H				H
• trends in level of compliance	M	M		M	L	
• client/stakeholder/ partner opinion	M		M			
• program mgmt opinions		M		M		

EXHIBIT 13

ISSUE CATEGORY	APPROACHES					
6.0 Required (Major Survey)	Reviews		Surveys/Consultations		Analysis	
Issues & Indicators	Literature Review	Document Review	Client/Stakeholder/ Partner	Program Management	Program Statistics	Policy
6.1 Alternatives to Federal Provision of Surveys?						
• client/stakeholder/ partner opinion	L		H			
• program mgmt opinions		M		H	M	M
• review of previous studies		H	H	H		
6.2 Increased opportunities for contracting-out, make or buy, cost-recovery, privatization or joint management?						
• client/stakeholder/ partner opinion	M		H			
• program mgmt opinions		H		M		
• review of previous studies		H	H	H	M	M

EXHIBIT 14

ISSUE/CATEGORY	APPROACHES					
6.0 Required (Major Survey)	Reviews		Surveys/Consultations		Analysis	
Issues & Indicators	Literature Review	Document Review	Client/Stakeholder/ Partner	Program Management	Program Statistics	Policy
6.3 Opportunities for productivity improvements, such as technological change and level of service revision?						
• client/stakeholder/ partner opinion		M	H	H		
• program mgmt opinions		H				
• review of previous studies		H	H	H		
6.4 Opportunity to promote economic and technical potential of survey programs?						
• client/stakeholder/ partner opinion	M		M	M		
• program mgmt opinions		M				
• review of previous studies		M	M	M		

EXHIBIT 15 - OPTION OVERVIEW

ISSUES	OPTION 1	OPTION 2	OPTION 3
2.0 Client Relevance	H	H	M/L
3.0 Program Management	H	L	H
4.0 Outcomes	H	H	M/L
5.0 Required (Regulatory)	M	M	M
6.0 Required Major Survey	M	M	M
APPROACHES			
Literature Review	X	X	X
Document Review	X	X	X
Client/Stakeholder/Partner Survey	X	X	X
Program Management Survey	X	X	X
Analyze Program Statistics	X	X	X
Policy Analysis	X	X	X
ESTIMATED COST			
Professional Days	155	150	140
Professional Fees	$73,625	$71,250	$66,500
Travel Cost	$13,500	$13,500	$13,500
Total Cost	$87,125	$84,750	$80,000

V EVALUATION OPTIONS

5.1 Introduction

Evaluation options are based on an analysis of the types of issues to include and/or the appropriate methodologies to employ. From our examination of the important issues, indicators, and approaches presented in the previous sections, we have developed three options for conducting the evaluation of the Natural Resource Conservation Sub-activity of the Conservation and Protection Activity. Options were based on the consensus of Steering Committee members and program personnel as to the types of evaluation issues to include in the study. Two predominant issue themes developed. First, interest was shown in issues that deal with the overall structure and resources devoted to the programs. These issues are covered within the Program Management issue category. A second logical grouping concerned the effects of the programs. The Outcomes and Client Relevance issue categories deal with the effects of programs.

The other major variable for option consideration is the type of methods or approaches to utilize in the evaluation. This essentially translates into a decision as to the appropriate surveying methodology to employ. Thus, our options are designed around issue category clusters and methodology.

Exhibit 15, shown opposite, presents an overview of the evaluation options (more detail is contained in the following section). The first option addresses all the evaluation issues which were recommended for inclusion in the evaluation study. This includes the Client Relevance, Program Management, Outcomes, Required (Regulatory) and Required (Major Survey). The second option again addresses all evaluation issues, however, emphasis is place on the program effects issues, Client Relevance and Outcomes. The third option again addresses all the evaluation issues, however, emphasis is placed on program management issues.

EXHIBIT 16 - APPROACH EFFORT AND OPTION COST

APPROACHES	OPTIONS			COMMENTS
	1 Days	2 Days	3 Days	
• Literature Review	15	15	15	
• Document Review	15	15	15	
• Client/Stakeholder/Partner Survey	40	45	20	• Extra resources for interviews
• Program Management Survey	40	30	50	• Extra resources for interviews
• Program Statistic Analysis	15	20	15	• Extra effort obtaining result measure statistics
• Policy Analysis	10	5	5	
• Project Management & Reporting	20	20	20	
• Total Professional Days	155	150	140	
• Weighted Average Per Diem	475	475	475	
• Professional Fees	73,625	71,250	66,500	
• Travel Cost Estimate	13,500	13,500	13,500	
• Total Cost Estimate	87,125	84,750	80,000	

5.2 Options

Exhibit 16, shown opposite, presents a preliminary estimate of the required resource effort in terms of person-days and the costs associated with each. The issues, approaches, and costs for each option are briefly summarized and described below.

5.2.1 Option 1

Issue Coverage

The first option addresses all the evaluation issues which were recommended for inclusion in the evaluation study. This would include an analysis of the following issues:

Issue	Degree of Emphasis/Coverage (L = Low M = Medium H = High)
○ 2.0 Client Relevance	H
○ 3.0 Program Management	H
○ 4.0 Outcomes	H
○ 5.0 Required (Regulatory)	M
○ 6.0 Required (Major Survey)	M

Approaches Used

The proposed methodology is to conduct personal interviews at Headquarters and in all the Regions. Interviews would be conducted with program management personnel, and key clients/partners/stakeholders. The program management survey would include the Directors-General and Directors of CWS and IWD at Headquarters, and C&P in all regions, as well as Branch and Field office personnel in order to ensure an adequate understanding of all aspects of program management and organization. Client, stakeholder, partner and expert interviews would be conducted with key individuals from provincial and municipal environmental agencies, environmental NGOs, university professors, and international environmental organizations. This will ensure that they have a sufficient understanding of Natural Resource Conservation program objectives, goals, management, organization, and structure in order to provide useful opinions.

Interview guides would be developed which focused on obtaining data and opinions on all the evaluation issues recommended for inclusion in the evaluation study.

The approach would rely heavily on conducting a majority of the surveys through in-depth personal interviews. Additional interviews may be undertaken by telephone. Other approaches include literature and documentation review, and the analysis of program statistics and overall policy.

Strengths

The strengths of this option include the following:

- allows for in-depth coverage of all the important evaluation issues identified during the assessment through personal interviews
- ensures coverage of all required evaluation issues
- reliable program resource information available

Cost

The major cost involved in this option results from the need to conduct personal interviews with program personnel and clients/stakeholders/partners both at Headquarters and in each region. A minimum visit of one week per region by a two person team should be undertaken. We estimate that this option would require a person-day resource effort of 133 days. Based on an average per diem of $475, professional fees would be approximately $73,250. In addition, there would be significant travel costs. Travel costs could be minimized by visiting the Pacific and Yukon (Vancouver), and the Western and Northern (Edmonton) regions on the same trip, and the Quebec (Quebec City) and Atlantic (Halifax) regions on another trip. We estimate the travel and lodging costs to be approximately $13,500. Thus, the approximate total cost for this option is $87,125.

5.2.2 Option 2

Issue Coverage

The second option would focus on addressing all required evaluation issues and the evaluation issues that deal with program effects. This would require an in-depth examination of client relevance and outcome issues. The program management evaluation issue would only be addressed to the extent that it would provide useful information relating to the effects of the program. Issue coverage for this option includes:

Issue	Degree of Emphasis/Coverage
○ 2.0 Client Relevance	H
○ 3.0 Program Management	L
○ 4.0 Outcomes	H
○ 5.0 Required (Regulatory)	M
○ 6.0 Required (Major Survey)	M

Approaches Used

The approach would rely on two key methodologies: conducting personal interviews with program management and clients, stakeholders and partners at Headquarters and in the regions; and the gathering and analysis of results measurement data. Interviews at Headquarters and in the Regions would be conducted with a wider range of clients, partners, stakeholders and experts. This would ensure that opinions would be solicited, not only from those who already interact extensively with the FWD and CWS groups delivering natural resource conservation programs, but also from others who may be able to provide advice on ways to improve the relevance of the programs to themselves, and other groups.

The C&P Results Measurement Project Report provides a framework for measuring the effects of Natural Resource Conservation programs. In addition, SOE reports and background documentation will provide key information on impacts and effects. A key factor determining the extent to which the C&P Results Measurement framework can be used will be the availability of the data required for results measurement. Preliminary indications are that the data is available, but may not be in the format required by the results measurement model.

Strengths

The strengths of this option include the following:

- allows for in-depth coverage of client relevance and outcomes issues through personal interviews
- significant C&P effort already expended in this area

Weaknesses

The weaknesses of this option include the following:

- no in-depth analysis of program management issues
- reliance on "results measures" which may not be fully developed at the time of the evaluation

Cost

The major cost involved in this option results from the need to conduct personal interviews with clients/stakeholders/partners and program managers both at Headquarters and in each region. Phone surveys of clients/stakeholders/partners could be undertaken to increase the sample size. As with option 1 a minimum visit of one week per region by a two person team should be undertaken. We estimate that this option would require a person-day resource effort of 150 days. Using a weighted average per diem of $475 per day total professional costs would be approximately $71,250. In addition, there would be significant travel costs. As with Option 1, travel costs could be minimized by visiting the Pacific and Yukon (Vancouver), and the Western and Northern (Edmonton) regions on the same trip, and the Quebec (Quebec City) and Atlantic (Halifax) regions on another trip. We estimate the travel and lodging costs to be approximately $13,500. Thus, the approximate total cost for this option is $84,750.

5.2.3 Option 3

Issue Coverage

The third option addresses the required evaluation issues, as well as program management issues. Client relevance and outcomes issues would be covered in less depth than in options 1 and 2. Issue coverage would be as follows:

Issue	Degree of Emphasis/Change
○ Client Relevance	M/L
○ Program Management	H
○ Outcomes	M/L
○ Required (Regulatory)	M
○ Required (Major Survey)	M

Approaches

The proposed methodology is to conduct personal interviews at Headquarters and in all the Regions. As with the other options interviews would be conducted with program management personnel and clients/partners/stakeholders. The program management survey would include the Directors-General and Directors of CWS and IWD at Headquarters, and C&P in all regions, as well as Branch and Field office personnel in order to ensure an adequate understanding of all aspects of program management and organization. Client, stakeholder, and partner interviews would be limited to key individuals in these groups, since they would need a reasonable understanding of program management, organization, and structure in order to provide useful opinions.

Interview guides would be developed which focused on obtaining data and opinions on program management and structure issues. The approach would rely heavily on conducting a majority of the surveys through in-depth personal interviews. Additional interviews with program managers may be undertaken by telephone to increase the sample size. Other approaches include literature and documentation review, and the analysis of program statistics and overall policy.

Strengths

The strengths of this option include the following:

- o the focus on program management and structure issues would allow significant data collection of resource information and breakdowns to be done
- o provides an opportunity to review the function of the matrix management system

Weaknesses

The weaknesses of this option is:

- o reduced emphasis on client relevance and outcomes issues.

Cost

As with the other options, the major cost involved in this option results from the need to conduct personal interviews with program managers and a reduced sample of clients/stakeholders/partners both at Headquarters and in each region. Phone surveys of additional program managers could be undertaken to increase the sample size. As with the other options a minimum visit of one week per region by a two person team should be undertaken. We estimate that this option would require a person-day resource effort of 140 days. Using a weighted average per diem of $475 per day total professional costs would be approximately $66,500. In addition, there would be significant travel costs. Travel costs could be minimized by visiting the Pacific and Yukon (Vancouver), and the Western and Northern (Edmonton) regions on the same trip, and the Quebec (Quebec City) and Atlantic (Halifax) regions on another trip. We estimate the travel and lodging costs to be approximately $13,500. Thus, the approximate total cost for this option is $80,000.

APPENDIX A

CONSERVATION AND PROTECTION RESULTS MODEL

Young & Wiltshire

Environment Canada / Environnement Canada

CONSERVATION AND PROTECTION

MARCH 198

MISSION

CONTRIBUTE TO THE CONSERVATION AND PROTECTION OF THE CANADIAN AND GLOBAL ENVIRONMENTS FOR SUSTAINED BENEFITS

NEEDS

A
CONSERVE CANADA'S NATURAL RESOURCES

B
MANAGE ECOLOGICAL AND ECONOMIC INTERDEPENDENCE

E
PROTECT CANADA'S ENVIRONMENT FROM DEGRADATION

EFFECTS
Environmental Improvements

A1
MIGRATORY BIRD POPULATIONS ARE SUSTAINED OR INCREASED

A7
WILDLIFE HABITAT IS MAINTAINED OR ENHANCED

A13
ENDANGERED SPECIES ARE REESTABLISHED AND REHABILITATED

A18
CANADA'S ACCESS (QUALITY/QUANTITY) TO INTERNATIONAL WATER AND WILDLIFE RESOURCES IS MAINTAINED OR ENHANCED

A24
REGIONAL ACCESS TO GOOD QUALITY WATER AND WILDLIFE RESOURCES IS MAINTAINED OR IMPROVED

A29
DAMAGES RESULTING FROM NATURAL HAZARDS ARE REDUCED

B1
CONSERVATION, DEVELOPMENT AND PROTECTION EFFORTS COMBINE TO PRODUCE A HEALTHY CANADIAN ECOSYSTEM AND ECONOMY

C1
ADVERSE ENVIRONMENTAL IMPACTS OF NEW INITIATIVES ARE REDUCED

C6
IMPACTS OF HARMFUL AIR & WATER EMISSIONS/EFFLUENTS ARE REDUCED

C12
HARMFUL IMPACTS OF TOXICS AND OTHER PRODUCTS ARE CONTROLLED

C17
ENVIRONMENTAL QUALITY AT SPILL AND WASTE SITES IS RESTORED TO ACCEPTABLE LEVELS

Enforcement / Compliance

A2
CANADIANS COMPLY WITH LEGISLATION AFFECTING MIGRATORY BIRD MANAGEMENT

A6
FEDERAL, PROVINCIAL AND PRIVATE LAND MANAGERS COMPLY WITH LEGISLATION TO PROTECT WILDLIFE HABITAT

A14
WILDLIFE MANAGERS AND CANADIANS COMPLY WITH LEGISLATION TO PROTECT ENDANGERED SPECIES

A19
LAND MANAGERS COMPLY WITH LEGISLATION RELATED TO CHANGES TO CANADA-U.S. RIVER SYSTEMS

C7
POLLUTERS COMPLY WITH LEGISLATION RELATED TO EMISSIONS AND EFFLUENTS

C13
USERS COMPLY WITH LEGISLATION ON THE INTRODUCTION, USE, TRANSPORTATION AND DISPOSAL OF TOXICS AND OTHER PRODUCTS

C18
POLLUTERS COMPLY WITH LEGISLATION ON THE CLEAN-UP OF SPILL/WASTE SITES

Influence / Leadership

A3
CANADIANS IMPLEMENT CO-OPERATIVE PROGRAMS WITH C&P TO INCREASE ENJOYMENT OF MIGRATORY BIRDS

A9
CANADIANS ACTIVELY SUPPORT WILDLIFE HABITAT MANAGEMENT, ENHANCEMENT AND MAINTENANCE

A15
PROGRAMS ARE IN PLACE TO PROTECT/REHABILITATE ENDANGERED SPECIES IN COOPERATION WITH OTHER STAKEHOLDERS

A20
EXTERNAL AFFAIRS, IJC & OTHER INTERNATIONAL FORA INCORPORATE C&P ADVICE ON WATER/WILDLIFE

A25
AGREEMENTS ON THE MANAGEMENT OF SHARED INTER-PROVINCIAL/TERRITORIAL WATER AND WILDLIFE RESOURCES ARE IN PLACE

A30
FLOOD PLAIN RESIDENTS ARE PROTECTED FROM MAJOR FLOODING EVENTS

B2
C&P PROGRAMS ARE MANAGED EFFECTIVELY & EFFICIENTLY

B5
ENVIRONMENTAL AND RESOURCE VALUE/PRICING CONSIDERATIONS ARE INTEGRATED INTO ECONOMIC PLANNING AND DECISION MAKING

C2
PROPONENTS INCORPORATE C&P ADVICE INTO DEVELOPMENT INITIATIVES

C8
ENVIRONMENTAL QUALITY OBJECTIVES OR GUIDELINES ARE DEVELOPED AND IMPLEMENTED

C14
CODES/GUIDELINES FOR LIFECYCLE MANAGEMENT OF CHEMICALS ARE DEVELOPED AND IMPLEMENTED

C19
CONTINGENCY PLANS AND OTHER MECHANISMS EXIST FOR DEALING WITH ENVIRONMENTAL POLLUTION EMERGENCIES

A4
PROVINCES/USA ACCEPT HARVEST LIMITS FOR GAME BIRDS

A10
LAND MANAGERS INCORPORATE WILDLIFE HABITAT CONCERNS INTO THEIR LAND AND AQUATIC ENVIRONMENTAL MANAGEMENT PRACTICES

A21
AGREEMENTS FOR THE MANAGEMENT OF CANADA-INTERNATIONAL WATER/WILDLIFE RESOURCES ARE IN PLACE

A26
WATER AND WILDLIFE MANAGEMENT PLANS FOR MAJOR DRAINAGE BASINS AND REGIONS ARE IN PLACE

A31
LAND MANAGERS IMPLEMENT LAND USE PRACTICES DESIGNED TO REDUCE DAMAGES CAUSED BY FLOODS AND MIGRATORY BIRDS

B3
C&P PROGRAMS AND POLICIES ARE DEVELOPED TO RESPOND TO NEW ENVIRONMENTAL ISSUES AND OPPORTUNITIES

B6
C&P ENVIRONMENTAL SCIENCE/RESEARCH IS INTERNATIONALLY RECOGNIZED

Communications

A5
CANADIANS RECEIVE AND UNDERSTAND INFORMATION ON THE STATUS, TRENDS AND BEHAVIOUR OF MIGRATORY BIRD POPULATIONS

A11
CANADIANS RECEIVE AND UNDERSTAND INFORMATION ON THE LOCATION, DYNAMICS AND SIGNIFICANCE OF WILDLIFE HABITAT

A16
CANADIANS RECEIVE AND UNDERSTAND INFORMATION ON THE STATUS & TRENDS OF ENDANGERED SPECIES POPULATIONS

A22
CANADIANS RECEIVE AND UNDERSTAND INFORMATION ON THE NATURE AND EXTENT OF CANADA-INTERNATIONAL WATER AND WILDLIFE ISSUES

A27
CANADIANS RECEIVE AND UNDERSTAND INFORMATION ON THE NATURE AND EXTENT OF REGIONAL WATER AND WILDLIFE ISSUES

A32
CANADIANS RECEIVE AND UNDERSTAND INFORMATION ON FLOOD RISK AREAS AND ON IMPENDING FLOOD EMERGENCIES

B4
CANADIANS RECEIVE EARLY WARNINGS & ISSUE SENSING ON EMERGING CONSERVATION/PROTECTION ISSUES

B7
CANADIANS ARE PROVIDED INTEGRATED INFORMATION ON THE STATE OF CANADA'S ENVIRONMENT

C3
CANADIANS RECEIVE AND UNDERSTAND C&P ADVICE ON ENVIRONMENTAL ASSESSMENT

C9
CANADIANS RECEIVE AND UNDERSTAND INFORMATION ON IDENTIFIED POLLUTANT LEVELS, TRENDS, PATHWAYS, TECHNOLOGIES AND IMPACTS ON AIR, WATER, WILDLIFE AND LAND

C15
CANADIANS RECEIVE AND UNDERSTAND INFORMATION ON THE LIFECYCLE OF CHEMICALS IN COMMERCE AND THEIR IMPACTS ON AIR, WATER, WILDLIFE AND LAND

C20
CANADIANS RECEIVE AND UNDERSTAND INFORMATION AND ADVICE ON HAZARDOUS WASTE AND SPILL SITE CLEANUP

Science / Data

A6
SCIENTIFIC KNOWLEDGE ON THE STATUS, TRENDS, BEHAVIOUR OF MIGRATORY BIRD POPULATIONS IS INCREASED

A12
SCIENTIFIC KNOWLEDGE ON THE LOCATION, DYNAMICS AND SIGNIFICANCE OF WILDLIFE HABITAT IS INCREASED

A17
SCIENTIFIC KNOWLEDGE ON THE STATUS AND TRENDS OF ENDANGERED SPECIES IS INCREASED

A23
SCIENTIFIC KNOWLEDGE AND EXPERTISE ON INTERNATIONAL WATER AND WILDLIFE ISSUES IS INCREASED

A28
SCIENTIFIC KNOWLEDGE ON THE NATURE AND EXTENT OF REGIONAL WATER AND WILDLIFE ISSUES IS INCREASED

A33
SCIENTIFIC KNOWLEDGE ON THE NATURE AND EXTENT OF NATURAL HAZARDS AND THEIR ECONOMIC IMPACTS IS INCREASED

B8
INTEGRATED SCIENTIFIC KNOWLEDGE ON THE POLLUTION USE, VALUE AND STATUS OF THE CANADIAN ECOSYSTEM IS INCREASED

C4
GUIDELINES FOR ENVIRONMENTAL ASSESSMENT ARE DEVELOPED

C5
BASELINE KNOWLEDGE TO FACILITATE IMPACT ASSESSMENT IS INCREASED

C10
SCIENTIFIC KNOWLEDGE ON IMPACTS OF EMISSIONS/EFFLUENTS ON AIR, WATER, WILDLIFE AND LAND IS INCREASED

C11
NEW POLLUTION CONTROL TECHNOLOGY AND EXPERTISE IS DEVELOPED

C16
SCIENTIFIC KNOWLEDGE RELATED TO LIFE CYCLE MANAGEMENT OF TOXICS AND THEIR IMPACTS IS INCREASED

C21
CONTROL TECHNOLOGIES FOR CLEAN-UP ARE DEVELOPED

ACTIVITIES

- MIGRATORY BIRDS MANAGEMENT
- HABITAT MANAGEMENT
- OTHER WILDLIFE MANAGEMENT
- WETLANDS MANAGEMENT
- CROP LOSS MANAGEMENT
- FLOOD DAMAGE REDUCTION
- PROTECTION OF INTERNATIONAL WATER AND WILDLIFE INTERESTS
- WATER QUALITY AND SUPPLY MANAGEMENT
- ENDANGERED SPECIES
- DATA AND RESEARCH

- STATE OF THE ENVIRONMENT
- ENVIRONMENT AND ECONOMY
- NEW PROGRAM AND POLICY DEVELOPMENT
- PROVISION OF FINANCE, ADMINISTRATION, PLANNING, PERSONNEL SERVICES
- EARLY WARNING OF ENVIRONMENTAL ISSUES

- ACID RAIN
- LEAD
- TOXICS
- PESTICIDES
- TOXIC RAIN
- EMERGENCIES
- CLEAN-UP
- CEPA/ECA
- ENVIRONMENTAL QUALITY OBJECTIVES
- CODES OF PRACTICE

APPENDIX B

ORGANIZATIONAL STRUCTURE OF THE INLAND WATERS DIRECTORATE

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Organizational Structure of the Inland Water Directorate

The following descriptions are based on the organizational structure of IWD at Headquarters. Regional IWD organizational structures may differ slightly depending on the regional program emphasis. In addition the Program Analysis and Coordination Branch is located at Headquarters only.

Water Planning and Management Branch

Aims and Objectives

The objective of the Water Planning and Management Branch is to influence water managers to provide Canadian with an adequate and sustained supply of good quality water in responding to high priority water issues.

Organizational Structure

There are three divisions in the Water Planning and Management Branch at Headquarters: the Engineering Division, the Socio-Economic Division and the Computer Systems Division.

Activities and Outputs

The Branch plays a leading role in implementing the key strategies of the Federal Water Policy. These are:

Knowledge: A major focus of the Branch is the development of new computer models to enable the analysis of major river basins. The Branch maintains Canada's foremost water-related bibliographic database. In addition, the Branch is currently in the process of establishing a National Water Use Database.

Legislation: The Branch administers the funds provided through the Canada Water Act for cooperative activities with the provinces, comprehensive river basin studies, flood damage reduction, and interprovincial apportionment agreements.

Economic Instruments: Branch economists have spent considerable time investigating the use of economic instruments to achieve water conservation objectives.

Integrated Planning: The Branch participates in many consultative and cooperative processes needed for reconciling all water uses and related activities, and in recognizing the growing importance of recreational, social, environmental and heritage values.

Awareness: The Branch hopes to increase the public's awareness of environmental and water conservation issues by participating in the development of interpretive displays, more active staff involvement in public forums, and marketing integrated and interpretive information on water.

Clients/Stakeholders/Partners

The Branch, because of its overall water management role, interacts extensively with other IWD and Environment Canada branches. Externally significant interactions are maintained with the following groups:

- International Joint Commission
- U.S. federal and state governments
- other federal government departments, such as Agriculture Canada, Transport Canada, Indian and Northern Affairs Canada and the Department of External Affairs
- representatives of provincial ministries of the environment and natural resources
- NGOs, such as the Rawson Academy of Water Science and the Canadian Water Resources Association

Water Quality Branch

Aims and Objectives

The Water Quality Branch provides reliable, uniform and comprehensive water quality data and advice, and information on water quality issues and problems for Canadian water managers and users. The WQB is responsible for monitoring and assessing the quality of Canada's inland waters in order to protect and preserve them for the use and enjoyment of present and future generations.

Organizational Structure

The Water Quality Branch comprises an interdisciplinary team of chemists, biologists, geologists, hydrologists, geographers, meteorologists, technicians, computer scientists, clerks, and secretaries, each of whom fills a specialized role in the complex undertaking

of measuring and assessing water quality. The Branch has two Divisions, the Water Quality Objectives Division and the Monitoring and Surveys Division, as well the Water Quality Laboratory located in Burlington which reports through the Director, WQB at headquarters.

Activities and Outputs

Inter-disciplinary teams provide provincial and municipal governments and the public with information and advice, and recommend policies and strategies on how to conserve and enhance the quality of Canada's freshwater. The following are major activity areas of the WQB.

Federal-Provincial and Territorial Cooperation

The Branch works cooperatively with the provinces through federal-provincial agreements to monitor the quality of Canadian rivers and lakes and to address water quality issues of mutual concern. Under these agreements, the two levels of government share the benefits of integrated monitoring networks and coordinate approaches to aquatic environmental quality issues.

Solving Water Quality Problems

Through its monitoring networks and intensive surveys, the WQB:

- o measure trends in the quality of Canadian waters;
- o assess the effectiveness of pollution control measures and the impact of human activities on Canada's water resources; and
- o detect emerging water quality problems.

Analyzing Samples

Branch staff analyze water, sediment, and biota samples in order to detect, identify and measure the exact quantities of the hundreds of substances present in aquatic substances. Testing is done in both the National Water Quality Laboratory in Burlington, Ontario and in regional labs.

Young & Wiltshire

NAQUADAT

The Branch maintains a national water quality database, NAQUADAT, in order to ensure that chemical and bacteriological data form Canada's lakes and rivers are available to federal and provincial water managers, and the general public.

Water Quality Guidelines

In order to promote the use of water management strategies that will allow the best use of the resource, Branch scientists establish "guidelines" or "objectives" for rivers and lakes. These indicate how "clean" water must be for specific use and thus serve as targets for environmental protection.

The Branch is also responsible for the development of these guidelines under federal legislation such as the Canada-U.S. Boundary Waters Treaty and the Canadian Environmental Protection Act. It also provides scientific advice to Agriculture Canada on the effects of pesticides on the aquatic environment under the Pest Control Products Act and participate with Health and Welfare Canada and the provinces in the establishment of drinking water guidelines for Canada.

CCME Activities

The Branch provides significant input to several activities of the Canadian Council of Ministers of Environment (CCME). The Branch is the lead agency for the coordination, development and promotion of water quality guidelines for CCME. It also provides scientific and technical advice to CCME on the quality of aquatic sediments and on the fate and effect of multi-media contaminants.

Clients/Stakeholders/Partners

The Branch interacts extensively with other IWD and Environment Canada branches. Externally significant interactions are maintained with the following groups:

- other federal government departments, such as Agriculture Canada, Transport Canada, Indian and Northern Affairs Canada and the Department of External Affairs
- representatives of provincial ministries of the environment and natural resources

- o NGOs, such as the Rawson Academy of Aquatic Science and the Canadian Water Resources Association
- o private engineering and environmental consulting firms
- o university researchers

Water Resources Branch

Aims and Objectives

The Water Resources Branch provide reliable, uniform and comprehensive water quantity data and advice, and information on water quantity issues and problems for Canadian water managers and users. The WRB is the national agency responsible for the collection, interpretation, and dissemination of standardized surface water quantity data and information in Canada. The data collected relates to stream flows and water level variations in rivers, streams and lakes, sediment transport, and related hydraulic and channel measurements. Information is produced on water availability, tools and techniques for hydrologic assessment used by the Branch are also distributed to professional groups.

Organizational Structure

The Water Resources Branch consists of two Divisions, the Water Survey of Canada and the Hydrology Division. In addition, WRB Headquarters has administrative responsibility for the Lake of the Woods Control Board Secretariat comprised of both federal members (WRB) and provincial members from Manitoba and Ontario.

Activities and Outputs

Under formal agreements signed with all provinces and with the Department of Indian and Northern Affairs Canada (on behalf of the Yukon and Northwest Territories), the Branch operates a Canada-wide network of 2700 gauging stations. These stations provide information that is vital to federal and provincial water-related programs, as well as to a wide range of public and private users. In all provinces except Quebec, where a provincial agency operates most of the stations, Water Survey staff measure stream flows, water levels and sediment concentrations in the field; make the necessary computations and interpretations; archive the data in its national data bank, HYDAT; and disseminate the information to a wide range of clients and users.

The Hydrology Division conducts network planning and evaluation studies to develop plans taking into account present and future needs for surface water data. The Division interprets the collected records to produce hydrologic information on specific floods or droughts, regional water resource patterns and trends, and new techniques for the analysis of surface water conditions. Fact sheets and brochures are also produced. This information is used in the planning, design, and operation of water programs and projects in Canada.

In addition, WRB staff participate in the activities of numerous international and interprovincial boards and commissions involved in the management of Canada's surface water. The Branch provides advice and expertise to the IJC, Ottawa River Regulation Board, the Prairie Provinces Water Board, the USGS, and several Canada/U.S. Treaties. Advice is also provided to Indian and Northern Affairs, Department of Fisheries and Oceans, Atomic Energy of Canada, Public Works, and several other federal and provincial agencies, as well as the private sector.

Annually, the Branch distributes 15,000 data products to users (publications, computer tapes and disks, maps, etc.), and responds to some 5,000 written or telephone requests for information. In addition, to the provincial partners there are over 75 public and private sector agencies that contribute data to the national publications.

Some current Branch studies include:

- development of new hydrometric equipment;
- use of remote sensing for hydrologic purposes;
- application of geographical information systems for data management and hydrologic interpretation
- Assiniboine River Basin integrated planning study
- water balance of the NWT and Yukon Territory
- Sediment budget for Churchill River diversion (Northern Flood Agreement)

Clients/Stakeholders/Partners

There are several thousand direct and indirect users of the Branch products and several hundred provincial users, clients and partners. The principal groups are:

- other federal government departments, such as Agriculture Canada, Transport Canada, Indian and Northern Affairs Canada, the Department of External Affairs, Public Works Canada and the Department of Fisheries and Oceans.

- o provincial ministries of the environment and natural resources
- o provincial hydro-electric power generating companies, such as Ontario Hydro and Hydro Quebec
- o NGOs, such as the Rawson Academy of Aquatic Science, the Canadian Water Resources Association, Conservation Authorities, Irrigation Districts, and recreational and environmental groups
- o private engineering and environmental consulting firms, and water using industries, educational institutions
- o municipalities and towns

Together these clients are responsible for wide areas of environmental preservation and enhancement, as well as the construction and operation of billions of dollars of water-related infrastructure each year.

- o university researchers

Program Analysis and Coordination Branch

Aims and Objectives

The Branch aims to provide a centralized control function by providing policy analysis and evaluation of IWD's activities in the context of the overall goals of the Directorate and in line with the Federal Water Policy and departmental objectives. Through close cooperation with the other IWD operational and research groups, the Branch monitors, analyzes and develops programming in light of changing public expectations and priorities. The Branch is also responsible for the Directorate's longer term planning processes and strategies.

Organizational Structure

The Program Analysis and Coordination Branch is comprised of a Program Analysis Division and a Program Coordination Division.

Activities and Outputs

The Branch primarily performs two functions: analysis and coordination. In so doing, the Branch undertakes the following activities:

- Provides a centralized function by evaluating IWD's activities in the context of the overall goals of the Directorate and in line with federal water policy and departmental objectives.

- Monitors, analyzes and develops programs in light of public expectations and changing priorities, and develops policies in support of the sustainable development concept.

- Ensures appropriate Directorate or national input to various federal, national and international programs, as well as various interdepartmental cooperative programs.

- Seeks opportunities to promote the interchange of scientific and technical expertise with the world water community, and to influence international water policy. It maintains links with both professional and intergovernmental organizations, and on a bilateral basis, with other countries.

Clients/Stakeholders/Partners

The Branch has a high degree of involvement with IWD and Environment Canada internal clients. The analysis and coordination role performed by the Branch, serves to create an internal client base. The Branch is also involved with other federal government departments and agencies; provincial environmental and natural resource agencies; NGOs of provincial, national and federal levels; universities; international agencies; as well as foreign governments.

National Water Research Institute (NWRI)

Aims and Objectives

The NWRI create and maintain internationally recognized Canadian expertise on water science and communicate scientific information and advice n order t assist with the sound management of the Canadian environment and with the development of water resources. The objective of the National Water Research Institute is to demonstrate leadership in developing the scientific knowledge and expertise required by Environment Canada to resolve important water management issues. The current research strategy emphasizes investigation into the critical ecosystem interactions which control the fate and effects of pollutants, improved understanding of the dynamics of important regional ecosystems, and the development of better aquatic assessment and prediction methodologies.

Organizational Structure

The National Water Research Institute is currently operating within a project based structure. Research is conducted within thirteen multi-disciplinary project groups, each of which addresses the science dimension of an emerging or priority water issue. These project groups fall under three research branches: Lakes Research Branch, Rivers Research Branch, and Research and Applications Branch.

Activities and Outputs

Lakes Research Branch

The Lakes Research Branch conducts applied research to provide effective management options for the conservation and protection of Canada's freshwater lakes. The research program encompasses natural lakes and man-made impoundments throughout Canada, as well as the large freshwater-dominated upper estuaries of major rivers, particularly the St. Lawrence and Fraser rivers. Although research emphasis is on the Great Lakes, study sites are located throughout the country.

The Branch is currently undertaking the following projects:

- Nutrient/Contaminant Interactions Project
- Sediment/Water Interactions Project
- Air/Water Interactions Project
- Lakes Restoration Project
- Nearshore/Offshore Interactions Project

Rivers Research Branch

The Rivers Research Branch conducts applied research and provides policy advice on a broad range of water resource issues associated with rivers and river basins in Canada. The Branch seeks to understand the complex relationships involving physical, biological and chemical interactions in Canadian rivers and drainage systems. This knowledge base is required to meet federal objectives for contemporary and emerging water resource management concerns that have national and international implications.

The Branch is structured around five research products which address contemporary and emerging national priorities. These are:

- o River Modelling Project
- o Contaminant/Pesticides Project
- o Transport of Airborne Pollutants Project
- o Ecotoxicology Project
- o Ground Water Contamination Project

Research and Applications Branch

The Research and Applications Branch conducts mission-oriented basic and applied research in areas of analytical chemistry and hydraulics. It is also responsible for transferring research and technology to the operation sectors of Environment Canada and for providing technical and scientific services such as current meter calibration, sedimentology and geotechnical services, and analytical quality assurance. The work is designed to address the priority issues of the Inland Waters Directorate and other agencies of the Department.

New, improved and more cost effective analytical techniques (including laboratory automation) are developed and evaluated for the measurement of priority chemical and biochemical parameters in environmental matrices. The Branch also has the lead responsibility for analytical quality assurance for most of Conservation and Protection's chemical monitoring programs.

The activities of the Branch are organized into the following three projects:

- o Analytical Chemistry Project
- o Hydraulics Project
- o Quality Assurance Project

Clients/Stakeholders/Partners

The research results of the NWRI are used by national and provincial water management agencies in Canada and by national agencies in other countries involved with water quality protection and conservation. These include the following:

- o other branches within IWD and EC
- o provincial ministries of the environment and/or natural resources

- other federal government departments, such as, Indian and Northern Affairs Canada, Fisheries and Oceans, and Transport Canada
- international agencies, such as the International Joint Commission, and the Environmental Protection Agency in the U.S.A

Recently the efforts of the Lakes Research Branch have supported the research and technology transfer needed to develop remedial action plans for the 17 Canadian Areas of Concern. These programs help to fulfil Canada's obligations under the Great Lakes Water Quality Agreement (GLWQA) between Canada and the United States.

National Hydrology Research Centre

Aims and Objectives

The NHRI create and maintain internationally recognized Canadian expertise on water science and communicate scientific information and advice n order t assist with the sound management of the Canadian environment and with the development of water resources. The objective of the National Hydrology Research Institute (NHRI) is to provide research and expertise in hydrology and aquatic science. The current research program focuses on many of the most important environmental concerns such as climatic change, drought, acid rain, the effects of pesticides, herbicides, and heavy metals on water systems and their inhabitants, and the impact of development in Northern Canada.

Organizational Structure

The National Hydrology Research Centre is organized into three divisions: Hydrology, Ground Water, and Aquatic Ecology. They are supported by Staff Services, Scientific Information and Research Support Divisions. However, NHRI's scientific program is, by necessity, arranged as interdisciplinary projects.

The NHRI is housed within the National Hydrology Research Centre, along with the Water Quality Branch of IWD, and the Hydrometeorlogical Research Division of the Canadian Climate Centre, and the Meteorological Inspection Office of the Atmospheric Environment Service. The close proximity of these various Environment Canada groups has resulted in there being extensive interactions between the groups on important environmental issues.

Activities and Outputs

Institute research projects are grouped into the following three main program areas, each of which has been identified by EC as a priority issue: hydrologic processes and climate change; man's impact on the environment; and northern water systems.

Hydrological Processes and Climate Change

One of today's leading environmental concerns is the potential effect of climate change. In order to determine the possible effects of a changing climate on the water cycle, the cycle itself must be better understood. This program addresses climate change through a series of studies on hydrological processes involving evaporation, transpiration, ground water, surface water, wetlands, and snow and ice. Scientist are also researching variations in Canada's historical climate, through the study of ice core samples in the Yukon Territory.

Human Interaction with the Hydrologic Cycle

This program deals with the impact of agriculture, industry and urbanization on water systems. The demands of modern agriculture are placing new stresses on water resources. NHRI scientists are studying the effects of the use of herbicides and pesticides on nearby water systems. In addition, research is undertaken to determine the effect of industrial effluents, such as toxics and heavy metals and the effects they have on water systems when discharged.

Northern Water Systems

This program is designed to provide information on the effects of such factors as economic development and pollution in northern water systems.

Clients/Stakeholders/Partners

The research results of the NHRI are used by national and provincial water management agencies in Canada and by national agencies in other countries. These include the following:

- other branches within IWD and EC
- provincial ministries of the environment and/or natural resources
- other federal government departments, such as, Indian and Northern Affairs Canada, Fisheries and Oceans, and Transport Canada
- international agencies, such as the International Joint Commission, and the Environmental Protection Agency in the U.S.A

APPENDIX C

ORGANIZATIONAL STRUCTURE OF THE

CANADIAN WILDLIFE SERVICE

Organizational Structure of the Canadian Wildlife Service

The following descriptions are based on the organizational structure of CWS at Headquarters. Regional CWS organizational structures may differ slightly depending on the regional program emphasis. In addition the Program Analysis and Coordination Branch is located at Headquarters only.

Migratory Birds and Wildlife Conservation Branch

Aims and Objectives

The Migratory Birds Convention (1916) and Migratory Birds Convention Act (1917) give the Government of Canada the responsibility to "protect from indiscriminate slaughter those species of migratory birds which are either useful or harmless to man", as well as to ensure they are preserved through the use of regulations. The Migratory Birds and Wildlife Conservation Branch of the Canadian Wildlife Service, is the agency responsible for ensuring the Convention, Act, and appropriate regulations are properly implemented.

The Branch undertakes research and provides policy advice and information on national and strategic issues in the following areas:

- Migratory Bird legislation;
- Wildlife legislation, compliance and enforcement;
- Migratory bird conservation;
- Habitat conservation;
- Endangered species conservation and protection; and
- Transboundary wildlife

Organizational Structure

The Branch is organized into four separate divisions as follows:

- Wildlife Legislation, Compliance and Enforcement;
- Migratory Birds Conservation;
- Endangered Species and Transboundary Wildlife; and
- Habitat Conservation.

In addition, the Branch has an Administrator for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Activities and Outputs

In general terms, the Branch is involved in two major types of activities: research-related functions; and providing policy advice and information on important wildlife conservation issues, strategies and plans.

The major activities of the Migratory Birds and Wildlife Conservation Branch, with respect to the CWS Long Term Operational Plan for 1990 -1994 are in the following areas:

1.1 Migratory Birds

- Coordination and development of annual hunting regulations;
- The establishment of the Eastern Canadian Duck Survey Program of NAWMP;
- Developing and implementing a Songbird Conservation Strategy and a survey and monitoring plan for songbirds;
- The establishment of "non-toxic" zones to address the problem of lead shot poisoning;
- Providing coordination and assistance in the development of cooperative migratory bird management accords with the provinces; and
- Amending the Migratory Birds Convention Act and the Canada Wildlife Act.

1.2 Wildlife Habitat

- Completion and implementation of the Habitat Conservation Strategy;
- Development and implementation of the Habitat Systems Plan;
- Identification and establishment of unique or exceptional wildlife habitat as Migratory Bird Sanctuaries (MBSs), National Wildlife Areas (NWAs), RAMSAR sites, and Western Hemispheric Shorebird Reserves (WHSSRs);

- Development and implementation of MOUs with OGDs for habitat protection; and

- Monitoring and targeting of habitat critical to NAWMP and other conservation and protection initiatives.

1.3 Endangered Species

- Development and implementation of CWS Policy on Endangered Species;

- Development of Federal Strategy on Endangered Species;

- Coordination of CWS input to the implementation of Recovery of Nationally Endangered Wildlife (RENEW) and providing Secretariat function;

- Implementation of the Endangered Species Recovery Fund through participation in a joint program with the World Wildlife Fund (Canada);

- Provide Secretariat function to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC); and

- Completion of recovery plans for all threatened and endangered species of migratory birds.

1.4 International Wildlife

- Submission of the Wild Animal and Protection Act to Parliament;

1.5 Regional/National Wildlife

- Development of a Protocol to Amend the Migratory Birds Convention Act (MBCA);

- Ensure wildlife and habitat concerns are addressed in Native land claim settlements by providing expertise to DIAND; and

- Completion and implementation of CWS policy and guidelines on native affairs to address shared wildlife and habitat concerns.

In addition, the Branch undertakes activities in support of the "Protect Canada's Environment from Degradation" need of the C&P Results Model. This is primarily in the area of providing a compendium of CWS policies and plans in response to oil spills.

Clients/Stakeholders/Partners

In addition to federal, provincial, and municipal governmental departments and agencies, the clients, partners, and stakeholders, of the Branch include: Ducks Unlimited; Wildlife Habitat Canada; U.S. Fish and Wildlife Service; Canadian Council on Ecological Areas; Committee on the Status of Endangered Wildlife in Canada; and the Canadian Wildlife Federation.

Wildlife, Toxicology and Surveys Branch

Aims and Objectives

The Branch undertakes research and conducts surveys to understand and mitigate the effects of toxics, pesticides and industrial chemicals on wildlife. The use of wildlife as an environmental indicator, is one of the main objectives of this division.

The Canadian Environmental Protection Act (CEPA) of 1988 enumerates the duties of the Government of Canada in regards to the environment. Several of these duties pertain to the functions carried out by the Wildlife, Toxicology and Surveys Branch. These include:

> ...[the] endeavour to protect the environment from the release of toxic substances;
>
> ...[the] endeavour to act expeditiously to assess whether substances in use in Canada are toxic or capable of becoming toxic.

Organizational Structure

The Wildlife, Toxicology and Surveys Branch is organized into five divisions, each headed by a Chief. These divisions are:

- Migratory Bird Research
- Migratory Bird Surveys
- Toxicology Research
- Chemistry Research
- Toxic Substances Evaluation and Monitoring

In addition, the Branch has a Long Range Transportation of Air Pollution (LRTAP) Coordinator.

Activities and Outputs

The major activities of the Wildlife Toxicology Surveys Branch with respect to the CWS Long Term Operational Plan for 1990 -1994 are in the following areas.

1.1 Migratory Birds

- Conducting research on the effects of climate change on migratory birds.

1.2 Wildlife Habitat

- Development of a program to identify key arctic breeding areas for shorebirds.

1.5 Regional/National Wildlife

- Participating in the establishment of a Cooperative Wildlife Health Laboratory at the University of Saskatchewan.

As noted above, the Branch has significant Protection activity responsibilities relating to CEPA. In addition, the Branch is involved in implementing the Wildlife Toxicology Fund. The Wildlife Toxicology Fund is a partnership with World Wildlife Fund Canada (WWFC) to support research in the private sector on priority concerns of Environment Canada in the field of wildlife toxicology. The second three-year agreement with WWFC runs from 1988 to 1991, it commits Environment Canada to provide a total of $1 million and WWFC to provide not less than $600K plus administration costs. It is anticipated there will be pressure to renew the agreement in 1991 at the same level of funding.

The Branch has been seeking to update its aviary facilities. A new aviary has been proposed for the National Wildlife Research Centre. The proposal is to build a 6000 square foot aviary since the current facilities are inadequate. A renovation of current facilities would not be cost-effective due to both the extensive nature of the work required and space constraints.

Clients/Stakeholders/Partners

The client, stakeholder and partner group includes the following entities:

- o The Canadian public, as well as several interest group components contained therein
- o Other government departments and agencies, at the federal, provincial, and municipal levels (e.g. External Affairs, Agriculture Canada)
- o National and international NGOs
- o International government agencies such as the U.S. Fish and Wildlife Service
- o Universities

NAWMP Implementation Branch

Aims and Objectives

This recently created Branch has as its primary responsibility the management, administration and coordination of the CWS involvement in the North American Waterfowl Management Plan.

The major activities of the North American Waterfowl Management Plan Implementation Branch, with respect to the CWS Long Term Operational Plan for 1990 -1994 are in the following areas.

1.1 Migratory Birds

- o Implementing the Canadian and continental long-term plans for the North American Waterfowl Management Plan (NAWMP) and its joint ventures to address the serious decline in waterfowl populations. This will involve:
  - coordination of existing Joint Ventures and incorporation of the new Pacific Joint Venture;
  - identification, protection and conservation of significant waterfowl habitat under the existing Prairie Habitat, Arctic Goose, Black Duck and Eastern Habitat Joint Ventures;
  - research and monitoring of waterfowl populations as to better manage the resource, including the establishment of the Eastern Canadian Duck Survey Program in support of the Black Duck Join Venture;
  - first revision of NAWMP, with modifications incorporated into implementation strategies and plans; and

- implementation of nationally and internationally coordinated evaluation systems to ensure maximum effectiveness of NAWMP activities.

Program Analysis and Coordination Branch

Aims and Objectives

The Branch performs a coordination role within the Canadian Wildlife Service providing a linkage between the various Regions and Branches within the CWS. The Branch provides overall coordination, planning and marketing services to the Service.

Organizational Structure

The Program Analysis and Coordination Branch is organized into the following five divisions:

- o Technical and Management Services
- o Program Coordination
- o Program Analysis
- o Scientific and Technical Publications
- o Socio-economic Analysis

In addition, the Branch has a Humane Trapping Coordinator.

Activities and Outputs

The Branch performs an analysis and coordination role, within CWS. The Branch is involved with the evaluation of CWS programs including planning cycle processes. In addition to this role, the area performs a publishing function, producing material for both internal and external dissemination.

The major activities of the Program Analysis and Coordination Branch, with respect to the CWS Long Term Operational Plan for 1990 -1994 are in the following areas.

1.4 International Wildlife

- o The implementation of the International Strategy as a basis for assuming a leadership role and a proactive approach in resolving international wildlife/habitat issues;

- o The development and implementation of agreements and action plans with circumpolar countries for protection of shared species and the establishment of a network of reserves; and the development of a strategic plan for the Mexico/Canada/U.S. MOU on the conservation of migratory birds; and

- o Participate in the development and/or implementation of the following international conventions:

  - RAMSAR Conference (1990)
  - CITES Conference (1992)
  - Western Hemispheric Convention
  - Convention on Biodiversity

1.5 Regional/National Wildlife

- o Coordinating federal, provincial and NGO activities for National Wildlife Week;

- o Assisting in developing new opportunities for cooperative wildlife research centres in the regions.

In addition, PACB has significant responsibilities relating to the "Manage Ecological and Economic Interdependence" need defined in the C&P Results Model.

Clients/Stakeholders/Partners

The Branch has a high degree of involvement with CWS internal clients. The coordination role performed by the area, serves to create an internal client base. The Branch is also involved with other federal government departments and agencies; municipal governments; provincial counterparts; NGOs at provincial, national and federal levels; universities; international agencies; as well as foreign governments (e.g. the area is currently working closely with the U.S. Fish and Wildlife Service).